ALABAMA COMMISSION ON HIGHER EDUCATION (ACHE)

No Child Left Behind Act (NCLB) Professional Development Program
P.L.107-110, Title II, Part A/Subpart 3

FIFTEEN YEAR REPORT: ALABAMA HIGHER EDUCATION PROFESSIONAL DEVELOPMENT FOR K-12 TEACHERS

Fiscal Years:

2002-2003 through 2016-2017

Prepared for the Alabama Commission on Higher Education
June 2017

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June 9, 2017

MEMORANDUM

TO: Alabama Commissioners of Higher Education

FROM: James E. Purcell, Executive Director

SUBJECT: No Child Left Behind Program, FY2002-2003 through FY2016-2017

The accompanying report describes the role and activities of the Alabama Commission on Higher Education (ACHE) in awarding grants authorized by No Child Left Behind (NCLB) to Alabama institutions of higher education from FY2002-2003 through FY2016-2017.

The objective of the report is to inform ACHE members and other interested persons how these funds have been used, acknowledge the degree of success in achieving the program's goals, and recognize project directors and other key persons who contributed to the success of the program.

Inquiries about the content and operation of individual projects may be directed to the project directors. Information on the administrative policies and procedures for Alabama's higher education No Child Left Behind program may be obtained from ACHE's Office of Institutional Effectiveness and Planning or the ACHE website: http://www.ache.state.al.us.

ACKNOWLEDGMENTS

Achieving Commission objectives for the No Child Left Behind (NCLB) program is the result of collaboration among all sectors of the state's education community. A number of agencies, their very capable staffs, the higher education institutions, and especially project participants all contributed directly to the significant and productive realization of the program's goals.

In particular, appreciation is especially expressed to--

- Congress for the vision to authorize and appropriate funding for this program;
- The No Child Left Behind program staff of the U. S. Department of Education for the effective national administration of this program;
- Commissioners, who provided overall support for the ACHE program, including reviewing project proposals and determining grant awards;
- Officials of the Alabama State Department of Education who provided guidance and background to make these projects practical, useful, and available in all districts in the state;
- Local education agencies for supporting participation, which assured the success of this program in meeting its overall objectives;
- The participating institutions and their officers who provided facilities and resources;
- The project directors, who developed and administered the projects, their presenters, their evaluators and their support staffs;
- The public and private corporations who provided resources supporting a number of projects;
- Peer review of project proposals and evaluators of the programs statewide, without whose experience, knowledge, and judgement the program would not have succeeded.

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FIFTEEN YEAR REPORT: ALABAMA HIGHER EDUCATION PROFESSIONAL DEVELOPMENT FOR K-12 TEACHERS

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Since 1985 the Alabama Commission on Higher Education (ACHE) has been administering a federally-funded K-12 professional development program under Title II of the Elementary and Secondary Education Act.[1] Under provisions of the legislation, a small percent of the appropriations awarded to each state was allocated to agencies of higher education for the implementation of an institutional competitive grant program designed to deliver professional development activities for teachers, principals, and para-professionals.

From its enactment in 2001 until its replacement in 2015, the U. S. Department of Education *No Child Left Behind (NCLB) Professional Development Program* continued the largest Federal program of grants to states for the professional development of K-12 teachers. This is the fourth in a series of published reports which attest to the success of the projects implemented by Alabama's institutions of higher education for each period of reauthorization of the legislation. It documents the achievements of the Commission's long-term, sustained professional development objectives; enumerates the diversity of opportunities offered by the institutions; gives visibility to the strength of collaborative partnerships between the public and private sectors; and describes innovative classroom practices. Predecessor publications include:

Four-Year Report: Alabama Higher Education Projects for K-12 Computer Learning, Foreign Languages, Mathematics, and Science – 1985-1989 (Title II: Education for Economic Security Act, PL 98-377).

Six-Year Report: Alabama Higher Education Projects for K-12 Mathematics and Science – 1989-1995 (Title II: Dwight D. Eisenhower Mathematics and Science Education Program, PL 100-297).

Six-Year Report: Alabama Higher Education Professional Development Multi-Year Projects for K-12 Teachers – Fiscal Years: 1995-1996 through 2000-2001 (Title II: Dwight D. Eisenhower Professional Development Program, PL 103-382).

FUNDING. The 15-year total budgets for these projects exceeded $31,000,000. Of this amount, $16,679,776 was provided by federal appropriations to the Commission. An additional $15,679,571 was generated by the projects from more than eighty external sources. The table below shows that external support from numerous private businesses, corporations, foundations, and government agencies doubled the amount of the federal appropriations to the projects. Thus, the total amount of support for ACHE NCLB K-12 professional development was twice the amount of the federal appropriation alone.

[1] In 1984 Congress enacted legislation amending the 1965 Elementary and Secondary Education Act to include the participation of state higher education agencies (SAHE's) in the delivery of professional development for teachers, a component of Title II.

Fiscal Year	Federal Appropriation	External Funding*	Total Funding
2002-2003	$ 1,175,367	$ 1,174,332	$ 2,349,699
2003-2004	$ 1,221,222	$ 823,087	$ 2,044,309
2004-2005	$ 1,215,464	$ 1,200,000	$ 2,415,464
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2013-2014	$ 954,951	$ 589,933	$ 1,544,884
2014-2015	$ 953,849	$ 2,310,326	$ 3,264,175
2015-2016	$ 949,571	$ 656,969	$ 1,606,540
2016-2017	$ 935,854	*-pending-‡*	*-pending-‡*
TOTAL	**$ 16,683,060**	**15,679,571+**	**$31,416,777+**

*Rounded estimates reported by projects.

‡Not determined at the time of this report.

+FY2002-2003 through FY2015-2016; does not include pending FY2016-2017 amount.

STATE OBJECTIVES. The ACHE objectives under NCLB were to: 1) provide long-term, sustained, intensive high-quality professional development for Alabama K-12 teachers, highly qualified paraprofessionals, and, if appropriate, principals; 2) provide access to these persons statewide, with a focus on high-need local school districts both public and private; 3) improve teacher knowledge of core academic subjects designed to increase student performance in content areas; and 4) align with the "Twelve (12) Standards for Effective Professional Development in Alabama" adopted by the Alabama State Board of Education (2002).

EXTERNAL EVALUATION.

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study) to conduct. Reports were submitted annually and included in the Project Director's final report to the ACHE.

Peer Review of Applications: The integrity of the process resided with members of peer review teams who reviewed the applications submitted and ranked the proposals. Those members are listed below, and those who chaired the panels are indicated by "‡" with the year(s) of their service.

Alabama State Department of Education

Dr. Katherine Mitchell, Director, Alabama Reading Initiative (ARI), 2002

Dr. Susan Villaume, Visiting Scholar, Alabama Reading Initiative (ARI), 2002

Dr. Mary Spor, Consultant, Alabama Reading Initiative (ARI), 2002

Ms. Cassandra Wheeler, staff, Alabama Reading Initiative (ARI), 2002

Ms. Pam Duke, staff, Alabama Reading Initiative (ARI), 2002

Ms. Katherine Elrod, 2002

Dr. Catherine Moore, Coordinator, Federal Programs, 2003

Dr. Anita T. Buckley-Commander, Director, Classroom Improvement, 2003, 2005

Ms. Cyndi Hill Townley, Education Specialist, Federal Programs Section, 2004

Ms. Audrie Bradford, Education Specialist, Federal Programs, 2006-2015

Ms. Shelia V. Patterson, Math Specialist, Alabama Math, Science, Technology Initiative (AMSTI), 2009-2014

Ms. Martha Lockett, Arts Specialist, 2011

Ms. Kristie Taylor, Mathematics Specialist, Alabama Math, Science, Technology Initiative (AMSTI), 2015

Alabama Teachers of the Year

Ms. Cynda Fickert, Auburn Junior High School, 2004 (proposal reviewer also in 2006)

Ms. Margaret Petty, Rainbow Elementary School, Madison, 2005

Ms. Cameron McKinley, Integrated Technology Teacher, Riverchase Elementary School, Hoover, AL, 2006

Mr. Roy Hudson, Theatre Instructor, Shades Valley High School, Birmingham, 2008 (proposal reviewer also in 2009)

Mr. Phil Rodney Wilson, Fine Arts Teacher, Ogletree Elementary School, Auburn, 2010

Dr. Gay F. Barnes, First Grade Teacher, Horizon Elementary School, Madison, 2011

Ms. Suzanne Culbreth, Math Teacher, Spain Park High School, Hoover, 2012

Ms. Tracy Pruitt, Alternate Alabama Teacher of the Year, Elementary Math Teacher, Montana Street Academic Magnet School, Dothan, 2013

Ms. Jennifer Brown, Science Teacher, Vestavia Hills High School, 2015

Other Classroom Teachers and School Administrators

Ms. Martha Chavers, Certified Grant Specialist, Retired Teacher, Dothan, 2002; 2003♯; 2004♯; 2005♯

Dr. Catherine Shields, Science Faculty, Jefferson County International Baccalaureate School, (division of Shades Valley High School), Birmingham, 2010; 2011♯; 2012♯

Ms. Cale Ebert, Vice President, Alabama Council of Teachers of Mathematics/Baldwin County Board of Education, Loxley, 2003

Ms. Janis Wingate Stewart, Principal, Meadowview Elementary School, Selma, 2003

Ms. Nancy Vawter, Supervisor, Secondary Science & Health, Montgomery Public Schools, 2006♯; 2007♯

Ms. Christine H. Nassar, Supervisor, Secondary Science, Mobile County Schools, 2008

University Administrators and Faculty

Dr. Ann Jones, Professor, College of Education, University of West Alabama, 2002♯

Dr. Larry C. Mullins, Dean, School of Liberal Arts, Auburn University at Montgomery, 2002

Dr. Charlotte Carter, Dean, Division of Arts and Sciences, Stillman College, Tuscaloosa, 2003-2004

Dr. William Richardson, Dean, College of Arts and Sciences, Troy University – Montgomery, 2003-2004

Dr. John Vickers, Interim Dean, College of Arts and Sciences, Alabama A & M University, 2004

Dr. Janet Warren, Dean, School of Education, Auburn University at Montgomery, 2004

Dr. Vagn K. Hansen, Dean, College of Arts and Sciences, University of North Alabama, 2005-2006

Dr. Cynthia Harper, Dean, College of Education & Professional Studies, Jacksonville State University, 2005-2007, 2008♯

Dr. Michael A. Cooke, Dean, College of Liberal Arts, University of West Alabama, 2005

Dr. Sandra Lee Jones, Dean (retired), College of Education, Troy University – Dothan, 2005

Dr. Benjamin Benford, Dean, College of Liberal Arts and Education, Tuskegee University, 2005- 2007

Dr. Edward L. Shaw, Jr., Professor, Elementary Science Education, College of Education, University of South Alabama, 2005- 2007

Dr. Jack Riley, Dean, Graduate Studies, Professor of Curriculum and Instruction, College of Education, University of Montevallo, 2007-2008, 2014-2015♯

Dr. Sandra Enger, Associate Professor of Science Education, University of Alabama in Huntsville, 2008

Dr. Martha Hocutt, Dean, Julia S. Tutwiler College of Education, University of West Alabama, 2008-2010♯; 2013♯; 2014♯

Dr. William S. Richardson, Interim Dean, College of Arts and Sciences, Troy University, 2009

Dr. Jennifer A. Brown, Dean, School of Education, Auburn University at Montgomery, 2010

Dr. Kevin A. Rollen, Executive Vice President, Alabama A & M University, 2011-2012

Dr. Celia Rudolph, Chair, Department of Teacher Education, Huntingdon College, 2012-2013

Dr. James F. Rinehart, Dean, College of Arts & Sciences, Professor of International Relations, Troy University, 2013-2014

Dr. Katie Cole Kinney, Associate Professor, Instructional Technology, College of Education and Human Science, University of North Alabama, 2014

Dr. Michael Burger, Dean, College of Arts & Sciences, Auburn University at Montgomery, 2015

Dr. Reenay R. H. Rogers, Chair, Department of Instructional Leadership & Support/Director, Assessment and Evaluation, Julia Tutwiler College of Education, University of West Alabama, 2015

Independent Professional Evaluators

Dr. Gypsy Abbott, Research Scientist – Evaluation and Assessment, Birmingham, 2010

Dr. Richard Littleton, Institutional Evaluator, Chelsea, 2013

PROJECTS. ACHE funded twenty-three (23) projects designed by public and private institutions to offer K-12 teachers statewide access to professional development programs, including those in high-poverty schools. The majority were multi-year projects in keeping with the goal of funding long-term, sustained professional development projects. The principal objectives were to change classroom practice, increase student performance, and foster collaboration among public and private sectors. The projects enrolled participants statewide from Alabama's public school districts and a number of private schools and systems. In addition, internet web sites for many projects provided access to other teachers, principals, and para-professionals.

IMPACTSEED: Improving Physics and Chemistry Teaching in Secondary Schools 2002-2017 (15 years)
Project Director: Dr. Nouredine Zetilli
Principal Administrator: Dr. Noureddine Bekhouche
Jacksonville State University (2002-2009; 2014-2017)
Snead State Community College (2010-2013)

ALAHASP: Hands-on Activity Science 2002-2017 (15 years)
Project Director: Dr. J. Michael Wyss
Co-Directors: Ms. Katie Busch; Ms. Kay Garcia; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham

STAR: Success Through Academic Research Project/Independent Study Program 2002-2017 (15 years)
Project Directors: Dr. John Pottenger (2002-2014); Dr. Andrea Word (2015-present)
Principal Administrators: Ms. Anita Rathz; Ms. Luciana Findlay; Ms. Evdoxia Chronis;
Ms. Tammy Pailtchikov
University of Alabama in Huntsville

Comprehensive Discipline Based Arts Education 2002-2017 (15 years)
Project Directors: Ms. Martha Lockett (2002-2007; 2011-present);
Dr. Jeanette Fresne (2003-present); Ms. Linda Dean (2007-2010)
Co-Director: Dr. Paige Vitulli
Principal Administrators: Ms. Jessica Freeland; Mr. Randy Foster
Alabama Institute for Education in the Arts
University of West Alabama (2002-2004)
University of South Alabama (2004-2016)

The University-School Partnership for Secondary Science (BioTeach) 2004-2017 (13 years)
Project Director: Dr. J. Michael Wyss
Principal Administrators: Dr. Mary Williams; Dr. Eric Blackwell; Mr. Ryan Reardon;
Dr. Laura Cotlin; Dr. Sabrina Walthall; Mr. Kevin Jarrett; Dr. Vanessa Williams;
Dr. Ollie Kelly; Dr. Danielle Yancey; Dr. Patrice Capers
University of Alabama at Birmingham

Physical Science in the 21st Century 2007-2017 (10 years)
Project Directors: Dr. Dennis Sunal
Principal Administrator: Dr. Cynthia Sunal
The University of Alabama

Wiregrass Math and Science Consortium 2002-2008 (6 years)
Project Director: Ms. Sandy Armstrong

Wiregrass Math, Science, and Technology Leadership Academy 2010-2017 (7 years)
Project Directors: Dr. Vijaya Gompa (2010-2016); Dr. Shawn Plash (2016-2017;
Troy University-Dothan

Teaching the Future: Mastery of Science Through Space Exploration 2002-2008 (6 years)
Project Director: Dr. John Pottenger
University of Alabama in Huntsville

AMSTI Lead Teacher Enhancement Project (ALSDE) 2011-2017 (6 Years)
Project Director: Ms. Shelly Hollis
University of North Alabama (2008-2009)

Project Directors: Dr. Debra Baird (2011- 2012); Ms. Carrie Lin (2012-2016)
Principal Administrator: Ms. Joyce Waid
Athens State University (2011-2016)

Project Directors: Dr. William Carr (2009-2010); Dr. Jordan Barkley (2010-2012);
Dr. Kelly Ryan (2012-2014); Dr. Eric Lee (2014-2015);
Principal Administrator: Ms. Tanya Barnes
Jacksonville State University (2009-2015)

Project Director: Dr. James Miller
Principal Administrators: Ms. Carol Mueller; Ms. Carolyn Pistorius
University of Alabama in Huntsville (2012-2016)

Project Director: Ms. Mary Lou Ewald;
Principal Administrator: Ms. Elizabeth Hickman
Auburn University (2014-2016)

Project Director: Mr. Clarence Pettway
Wallace Community College-Selma/Alabama State University (2014-2016)

Project Directors: Ms. Kimberly Dove; Ms. Sherrie Blackmon
Troy University (2015-2016)

Project Director: Dr. André Green
University of South Alabama (2016-2017)

EMCAT: Exploring Mathematical Concepts through Application 2001-2005 (4 years)
Project Director: Dr. Delisa Dismukes
Jacksonville State University

TIMES: Technological Integrations of Mathematical Environments and Studies 2007-2011 (4 years)
Project Directors: Dr. Jan Case; Dr. Jordan Barkley; Ms. Sharon Padgett
Jacksonville State University

Extended Communities of Practice: Mastery of Science Education-Leadership 2002-2006 (4 years)
Project Director: Dr. Deborah-Childs-Bowen
Samford University

Grand Tour:
Project Directors: Dr. Brent H. Halvonik; Mr. Tom Bryant (Alabama Humanities Foundation)
University of Montevallo: Global Pathways of Language 2002-2003 (1 year)

Project Directors: Dr. Peter Howard; Mr. Tom Bryant (Alabama Humanities Foundation)
Troy University: Language through Culture 2003-2005 (2 years)

Critical Thinking/Problem Solving: A Discrete Math Leadership Institute (K-8) 2002-2003 (1 years)
Project Director: Dr. Chris Roger
Auburn University

Strategic Teaching for Improved Performance of Students (TIPS) 2008-2010 (2 years)
Project Director: Dr. Edna Brabham
Auburn University

Composition, Comprehension, and Computation II and III 2006-2008 (2 years)
Project Director: Dr. Marian Parker
Troy University

Revitalizing Civics, Government and Economics Education- Southeast Alabama 2009-2011 (2 years)
Project Director: Dr. Dianne Gossett; Ms. Nadine Scarborough
Troy University

Helping Teachers to Help Students in Mathematics 2002-2004 (2 years)
Project Director: Ms. Mary Jane Turner
Birmingham Southern College

Utilizing an Inquiry Based Approach to Improve Science/Mathematics in Greene and Wilcox Counties 2006-2008 (2 years)
Project Directors: Dr. Mohammed Oazi; Dr. Carlton Morris
Tuskegee University

Alabama Reading Initiative (ALSDE) 2003-2004 (1 year)
Project Directors: Dr. Karen Foster; Dr. Wendell Thompson; Dr. Louanne Jacobs
Alabama A&M University

Project Director: Dr. Edna Brabham
Auburn University

Project Director: Dr. Lynne Mills
Auburn University-Montgomery

Project Director: Dr. Carol Uline
Jacksonville State University

Project Director: Dr. Jane W. Hawk
Troy University

Project Director: *Dr. Maryann Manning*
University of Alabama at Birmingham

Project Director: Dr. Kerry Rhone; Dr. Fieda Kalb
University of Montevallo

Project Director: Dr. Carolyn P. Casteel
University of South Alabama

Improving Teacher Quality: Mastery of Content-Teaching Writing 2003-2004 (1 year)
Project Directors: Dr. Rhonda Bowron; Dr. Susan Oliver
Troy University

Professional Development for Chemistry Teachers 2005-2006 (1 year)
Project Director: Dr. Jacqueline A. Nikles
University of Alabama at Birmingham

CORE (Collaborative Regional Education): Content Knowledge, Professional Development 2014-2015 (1 year)
Project Director: Dr. Alicia Simmons
Jacksonville State University

PARTNERSHIPS.

ACHE/Alabama State Department of Education (ALSDE): During this 15-year period $2,217,743 was set aside to support projects/initiatives administered by the ALSDE that were of high priority to the state of Alabama: The Alabama Reading Initiative (ARI) in the amount of $191,378 and the Alabama Mathematics, Science, and Technology Initiative (AMSTI) in the amount of $2,026,365. All funded projects were aligned with the "Twelve (12) Standards for Effective Professional Development in Alabama" adopted by the Alabama State Board of Education.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: Project Directors were highly successful in generating significant financial support as well as in-kind services to support their respective projects. The following roster represents funding partners as reported by the projects:

Alabama Department of Economic and Community Affairs (ADECA)
Alabama Gives Day
Alabama Humanities Foundation
Alabama LASER
Alabama Power Foundation
Alabama School for the Deaf
Alabama Shakespeare Festival
Alabama State Council for the Arts
Alabama State Department of Education
Alabama Technology in Motion
American Honda Foundation
Association for Supervision and Curriculum Development
Athens Bible College
Blue Cross-Blue Shield
Birmingham Botanical Gardens
Birmingham Public Library
Birmingham Museum of Art
Books-A-Million
Bowman Foundation
Buffalo Rock
Carolina Biological Supply Co.
Caring Foundation
CCV Software
Central Alabama Community Foundation
Center for Archeological Studies
ChildCraft Educational Foundation of America
Chick-Fil-A
Civil Air Patrol
Concordia College – Selma
Corwin Press – Sage Publications
Cottage Hill Cleaners
Cultural Alliance of Greater Birmingham
Daniel Foundation
Delta Education
Domino's Pizza – Gadsden
Gadsden Center – University of Alabama
Gulf Coast Exploreum
Gulf Coast Hanger
Higher Ground Roasters
Hoover Foundation
John Lockett, Attorney
International Paper
Kathy G & Co.
Learning Tree
Leeds Optimist
Legacy, Inc.
Library of Congress
Lowder Family Foundation
Math Helper
McDowell Environmental Center
McWane Science Center
Mineral Information Institute
Mobile Museum of Art
Montgomery Museum of Fine Art
NASA
NASCO Science
National Science Foundation
Navy Reserve
Office Max
Pearson Publishing
Publix Grocery
Rosen Classroom BooksSERVE, Inc.
Rutgers University
St. John's Episcopal Church
Southeast Center for Education in the Arts
Southern Museum of Flight
Temple Beth-Or
Tensor Foundation
The Private Eye®
Tom Snyder Software
Toyota
Tractor and Equipment

Dothan Area Chamber of Commerce
Dry Cleaners of Mobile
"Economics America"
Educational Foundation of America
Engineering is Elementary
Fisher Scientific
Trader Joe's
University of Alabama Press
Vulcan Park
Wal-Mart
"We the People"
Wright Attitudes
WHIL (Mobile)

PERFORMANCE OUTCOMES. Achieving ACHE state objectives identified on page 2 of this Summary resulted in an annual average of more than 1,000 teachers, principals, and paraprofessionals participating in professional development across one hundred thirty-eight (138) school districts, eighty (80) of which were "high need districts". Such activities impacted an estimated 70,000 students each year.

A number of these projects attained national recognition: Alabama Hands-on Activity Science Program (ALAHASP); Alabama Math, Science, and Technology (AMSTI); Comprehensive Arts Education; Improving Physics and Chemistry Teaching in Secondary Education (IMPACTSEED); Physical Science in the 21st Century: Improving Teacher Quality and Mastery of Content (PS-21); Success Through Academic Research (STAR) Project: The Independent Study Scholarship Program; and University-School Partnership for Secondary Science (BIO-Teach).

Major factors contributing to achieving these state objectives were the funding stream, the integrity of the external evaluation process, and the partnerships. Most importantly, the quality of the projects was due to the Project Directors' vision and leadership as well as the administrative oversight of their very capable staffs in the delivery of professional development to teachers in all core subjects statewide.

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PART ONE: BACKGROUND

FEDERAL LEGISLATION: "Preparing, Training, and Recruiting High Quality Teachers and Principals" program (Title II of the Elementary and Secondary Education Act of 1965 (ESEA) as amended was enacted in 2001 as part of the "No Child Left Behind Act" (Public Law 107-110). The Title II program is the largest federal program supporting professional development activities to improve teaching and learning. Under this program, funds were made available to state educational agencies (SEAs), local educational agencies (LEAs), state agencies for higher education (SAHEs), and institutions of higher education (IHEs) to support and help shape state and local professional development activities. The No Child Left Behind Program expanded and modified its predecessor, the Dwight David Eisenhower Professional Development Program, and had a direct relationship to systemic reform and student achievement tied to challenging state content and performance standards.

From its enactment in 2001 until its replacement in 2015, the U. S. Department of Education *No Child Left Behind (NCLB) Professional Development Program* continued the largest Federal program of grants to states for the professional development of K-12 teachers. Emphasis was on the content areas of mathematics and science, but all core subjects were included. Of the appropriations awarded to each state, a small percent was allocated to SAHEs, which in turn awarded grants competitively to institutions of higher education to deliver professional development activities for teachers, principals, and para-professionals.

The objectives of the NCLB legislation were twofold: 1) Increase student academic achievement through strategies such as improving teacher and principal quality and increasing the number of highly qualified teachers in the classroom and highly qualified principals and assistant principals in schools; and 2) Hold local educational agencies and schools accountable for improvements in student academic achievement." [2] SAHEs received funding to implement the objectives by issuing subgrants on a competitive basis to eligible partnerships, for professional development activities in core academic subjects. Eligible partnerships were defined as: 1) A private or State institution of higher education and the division of the institution that prepares teachers and principals; 2) A school of arts and sciences; and 3) A high-need local educational agency. . ."[3]

[2] P.L. 107-110, Title II, Part A, §2101

[3] P.L. 107-110, Title II, Part A, Sup [P.L. 107-110, Title II, Part A, Subpart 3, §2131-2132]

STATE OBJECTIVES: The ACHE objectives under NCLB were to: 1) provide long-term, sustained, intensive high-quality professional development for Alabama K-12 teachers, highly qualified paraprofessionals, and, if appropriate, principals; 2) provide access to these persons statewide with a focus on high-need local school districts both public and private; 3) improve teacher knowledge of core academic subjects designed to increase student performance in content areas; and 4) align with the "Twelve (12) Standards for Effective Professional Development in Alabama" adopted by the Alabama State Board of Education (2002).

FUNDING: Federal appropriations from the U. S. Department of Education for the 15-year period amounted to $16,679,778, ranging from a high of $1,232,939 (FY2009-2010) to $932,572 (FY 2016-2017). In addition, individual projects reported an additional $15,000,000 from businesses, corporations, foundations, and government agencies, doubling the amount of the federal appropriations. As shown in the table below, total project funding during the 15-year period exceeded $31,000,000.

Fiscal Year	Federal Appropriation	External Funding*	Total Funding
2002-2003	$ 1,175,367	$ 1,174,332	$ 2,349,699
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TOTAL	**$ 16,683,060**	**15,679,571**+	**$31,416,777**+

*Rounded estimates reported by projects.

‡Not determined at the time of this report.

+FY2002-2003 through FY2015-2016; does not include pending FY2016-2017 amount.

In continued collaboration with the Alabama State Department of Education (ALSDE), the ACHE competitive grant awards included two projects, which supported major statewide initiatives under ALSDE leadership: A continuation of funding for the Alabama Reading Initiative (ARI)[4] and the Alabama Math, Science, and Technology Initiative (AMSTI) totaled $2,217,743. Competitive grants to institutions supporting these initiatives totaled 191,378 for ARI and $2,026,365 for AMSTI.

[4] Previously funded under the Dwight D. Eisenhower Professional Development Program FY1998-FY1999 to FY 2001-2002

EXTERNAL EVALUATION.

Peer Review of Applications: In response to Requests for Proposals, institutions submitted applications for multi-year grants for the delivery professional development programs statewide, including high-poverty schools. The principal objectives were to reshape classroom practice, increase student performance, as well as foster collaboration among public and private sectors. To ensure integrity of the process, applications were reviewed by external evaluators for ranking. The rankings were subsequently presented to Commissioners for the determination of sub-grant awards. Grants to institutions ranged from $17,441 to $230,000.

Members of the peer review teams which included staff of the Alabama State Department of Education; Alabama Teachers of the Year; K-12 Teachers and Administrators; University Faculty and Administrators; and Independent Professional Evaluators are listed below. Those who chaired the panels are indicated by "‡" with the year(s) of their service.

Alabama State Department of Education

Dr. Katherine Mitchell, Director, Alabama Reading Initiative (ARI), 2002
Dr. Susan Villaume, Visiting Scholar, Alabama Reading Initiative (ARI), 2002
Dr. Mary Spor, Consultant, Alabama Reading Initiative (ARI), 2002
Ms. Cassandra Wheeler, staff, Alabama Reading Initiative (ARI), 2002
Ms. Pam Duke, staff, Alabama Reading Initiative (ARI), 2002
Ms. Katherine Elrod, 2002
Dr. Catherine Moore, Coordinator, Federal Programs, 2003
Dr. Anita T. Buckley-Commander, Director, Classroom Improvement, 2003, 2005
Ms. Cyndi Hill Townley, Education Specialist, Federal Programs Section, 2004
Ms. Audrie Bradford, Education Specialist, Federal Programs, 2006-2015
Ms. Shelia V. Patterson, Math Specialist, Alabama Math, Science, Technology Initiative (AMSTI), 2009-2014
Ms. Martha Lockett, Arts Specialist, 2011
Ms. Kristie Taylor, Mathematics Specialist, Alabama Math, Science, Technology Initiative (AMSTI), 2015

Alabama Teachers of the Year

Ms. Cynda Fickert, Auburn Junior High School, 2004 (proposal reviewer also in 2006)
Ms. Margaret Petty, Rainbow Elementary School, Madison, 2005
Ms. Cameron McKinley, Integrated Technology Teacher, Riverchase Elementary School, Hoover, AL, 2006
Mr. Roy Hudson, Theatre Instructor, Shades Valley High School, Birmingham, 2008 (proposal reviewer also in 2009)
Mr. Phil Rodney Wilson, Fine Arts Teacher, Ogletree Elementary School, Auburn, 2010
Dr. Gay F. Barnes, First Grade Teacher, Horizon Elementary School, Madison, 2011
Ms. Suzanne Culbreth, Math Teacher, Spain Park High School, Hoover, 2012

Ms. Tracy Pruitt, Alternate Alabama Teacher of the Year, Elementary Math Teacher, Montana Street Academic Magnet School, Dothan, 2013

Ms. Jennifer Brown, Science Teacher, Vestavia Hills High School, 2015

Other Classroom Teachers and School Administrators

Ms. Martha Chavers, Certified Grant Specialist, Retired Teacher, Dothan, 2002; 2003♯; 2004♯; 2005♯

Dr. Catherine Shields, Science Faculty, Jefferson County International Baccalaureate School, (division of Shades Valley High School), Birmingham, 2010; 2011♯; 2012♯

Ms. Cale Ebert, Vice President, Alabama Council of Teachers of Mathematics/Baldwin County Board of Education, Loxley, 2003

Ms. Janis Wingate Stewart, Principal, Meadowview Elementary School, Selma, 2003

Ms. Nancy Vawter, Supervisor, Secondary Science & Health, Montgomery Public Schools, 2006♯; 2007♯

Ms. Christine H. Nassar, Supervisor, Secondary Science, Mobile County Schools, 2008

University Administrators and Faculty

Dr. Ann Jones, Professor, College of Education, University of West Alabama, 2002♯

Dr. Larry C. Mullins, Dean, School of Liberal Arts, Auburn University at Montgomery, 2002

Dr. Charlotte Carter, Dean, Division of Arts and Sciences, Stillman College, Tuscaloosa, 2003-2004

Dr. William Richardson, Dean, College of Arts and Sciences, Troy University – Montgomery, 2003-2004

Dr. John Vickers, Interim Dean, College of Arts and Sciences, Alabama A & M University, 2004

Dr. Janet Warren, Dean, School of Education, Auburn University at Montgomery, 2004

Dr. Vagn K. Hansen, Dean, College of Arts and Sciences, University of North Alabama, 2005-2006

Dr. Cynthia Harper, Dean, College of Education & Professional Studies, Jacksonville State University, 2005-2007, 2008♯

Dr. Michael A. Cooke, Dean, College of Liberal Arts, University of West Alabama, 2005

Dr. Sandra Lee Jones, Dean (retired), College of Education, Troy University – Dothan, 2005

Dr. Benjamin Benford, Dean, College of Liberal Arts and Education, Tuskegee University, 2005- 2007

Dr. Edward L. Shaw, Jr., Professor, Elementary Science Education, College of Education, University of South Alabama, 2005- 2007

Dr. Jack Riley, Dean, Graduate Studies, Professor of Curriculum and Instruction, College of Education, University of Montevallo, 2007-2008, 2014-2015♯

Dr. Sandra Enger, Associate Professor of Science Education, University of Alabama in Huntsville, 2008

Dr. Martha Hocutt, Dean, Julia S. Tutwiler College of Education, University of West Alabama, 2008-2010♯; 2013♯; 2014♯

Dr. William S. Richardson, Interim Dean, College of Arts and Sciences, Troy University, 2009

Dr. Jennifer A. Brown, Dean, School of Education, Auburn University at Montgomery, 2010

Dr. Kevin A. Rollen, Executive Vice President, Alabama A & M University, 2011-2012

Dr. Celia Rudolph, Chair, Department of Teacher Education, Huntingdon College, 2012-2013

Dr. James F. Rinehart, Dean, College of Arts & Sciences, Professor of International Relations, Troy University, 2013-2014

Dr. Katie Cole Kinney, Associate Professor, Instructional Technology, College of Education and Human Science, University of North Alabama, 2014

Dr. Michael Burger, Dean, College of Arts & Sciences, Auburn University at Montgomery, 2015

Dr. Reenay R. H. Rogers, Chair, Department of Instructional Leadership & Support/Director, Assessment and Evaluation, Julia Tutwiler College of Education, University of West Alabama, 2015

Independent Professional Evaluators

Dr. Gypsy Abbott, Research Scientist – Evaluation and Assessment, Birmingham, 2010

Dr. Richard Littleton, Institutional Evaluator, Chelsea, 2013

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the annual evaluation of each of the projects to determine the extent to which the objectives described in the institutional proposal were achieved. Project Directors were required to contract with an external evaluator (an agency or expert in professional development of the project's field(s) of study) to conduct an ongoing evaluation of project activities. These reports of the on-site evaluation of activities, project leadership, instruction, and representative activities throughout the period of the grant were submitted annually to the ACHE.

PROJECTS: ACHE funded twenty-three (23) projects designed by public and private institutions to offer K-12 teachers statewide access to professional development programs, including those in high-poverty schools. The majority were multi-year projects in keeping with the goal of funding long-term, sustained professional development projects. The principal objectives were to change classroom practice, increase student performance, and foster collaboration among public and private sectors. The projects enrolled participants statewide from Alabama's public school districts and a number of private schools and systems. In addition, internet web sites for many projects provided access to other teachers, principals, and para-professionals.

IMPACTSEED: Improving Physics and Chemistry Teaching in Secondary Schools 2002-2017 (15 years)
Project Director: Dr. Nouredine Zetilli
Principal Administrator: Dr. Noureddine Bekhouche
Jacksonville State University (2002-2009; 2014-2017)
Snead State Community College (2010-2013)

ALAHASP: Hands-on Activity Science 2002-2017 (15 years)
Project Director: Dr. J. Michael Wyss
Co-Directors: Ms. Katie Busch; Ms. Kay Garcia; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham

STAR: Success Through Academic Research Project/Independent Study Program 2002-2017 (15 years)
Project Directors: Dr. John Pottenger (2002-2014); Dr. Andrea Word (2015-present)
Principal Administrators: Ms. Anita Rathz; Ms. Luciana Findlay; Ms. Evdoxia Chronis; Ms. Tammy Pailtchikov
University of Alabama in Huntsville

Comprehensive Discipline Based Arts Education 2002-2017 (15 years)
Project Directors: Ms. Martha Lockett (2002-2007; 2011-present);
Dr. Jeanette Fresne (2003-present); Ms. Linda Dean (2007-2010)
Co-Director: Dr. Paige Vitulli
Principal Administrators: Ms. Jessica Freeland; Mr. Randy Foster
Alabama Institute for Education in the Arts
University of West Alabama (2002-2004)
University of South Alabama (2004-2016)

The University-School Partnership for Secondary Science (BioTeach) 2004-2017 (13 years)
Project Director: Dr. J. Michael Wyss
Principal Administrators: Dr. Mary Williams; Dr. Eric Blackwell; Mr. Ryan Reardon;
Dr. Laura Cotlin; Dr. Sabrina Walthall; Mr. Kevin Jarrett; Dr. Vanessa Williams;
Dr. Ollie Kelly; Dr. Danielle Yancey; Dr. Patrice Capers
University of Alabama at Birmingham

Physical Science in the 21st Century 2007-2017 (10 years)
Project Directors: Dr. Dennis Sunal
Principal Administrator: Dr. Cynthia Sunal
The University of Alabama

Wiregrass Math and Science Consortium 2002-2008 (6 years)
Project Directors: Ms. Sandy Armstrong

Wiregrass Math, Science, and Technology Leadership Academy 2010-2017 (7 years)
Project Directors: Dr. Vijaya Gompa (2010-2016); Dr. Shawn Plash (2016-2017;
Troy University-Dothan

Teaching the Future: Mastery of Science Through Space Exploration 2002-2008 (6 years)
Project Director: Dr. John Pottenger
University of Alabama in Huntsville

AMSTI Lead Teacher Enhancement Project (ALSDE) 2011-2017 (6 Years)
Project Director: Ms. Shelly Hollis
University of North Alabama (2008-2009)

Project Directors: Dr. Debra Baird (2011- 2012); Ms. Carrie Lin (2012-2016)
Principal Administrator: Ms. Joyce Waid
Athens State University (2011-2016)

Project Directors: Dr. William Carr (2009-2010); Dr. Jordan Barkley (2010-2012);
Dr. Kelly Ryan (2012-2014); Dr. Eric Lee (2014-2015);
Principal Administrator: Ms. Tanya Barnes
Jacksonville State University (2009-2015)

Project Director: Dr. James Miller
Principal Administrators: Ms. Carol Mueller; Ms. Carolyn Pistorius
University of Alabama in Huntsville (2012-2016)

Project Director: Ms. Mary Lou Ewald;
Principal Administrator: Ms. Elizabeth Hickman
Auburn University (2014-2016)

Project Director: Mr. Clarence Pettway
Wallace Community College-Selma/Alabama State University (2014-2016)

Project Directors: Ms. Kimberly Dove; Ms. Sherrie Blackmon
Troy University (2015-2016)

Project Director: Dr. André Green
University of South Alabama (2016-2017)

EMCAT: Exploring Mathematical Concepts through Application 2001-2005 (4 years)
Project Director: Dr. Delisa Dismukes
Jacksonville State University

TIMES: Technological Integrations of Mathematical Environments and Studies 2007-2011 (4 years)
Project Directors: Dr. Jan Case; Dr. Jordan Barkley; Ms. Sharon Padgett
Jacksonville State University

Extended Communities of Practice: Mastery of Science Education-Leadership 2002-2006 (4 years)
Project Director: Dr. Deborah-Childs-Bowen
Samford University

Grand Tour:
Project Directors: Dr. Brent H. Halvonik; Mr. Tom Bryant (Alabama Humanities Foundation)
University of Montevallo: Global Pathways of Language 2002-2003 (1 year)

Project Directors: Dr. Peter Howard; Mr. Tom Bryant (Alabama Humanities Foundation)
Troy University: Language through Culture 2003-2005 (2 years)

Critical Thinking/Problem Solving: A Discrete Math Leadership Institute (K-8) 2002-2003 (1 years)
Project Director: Dr. Chris Roger
Auburn University

Strategic Teaching for Improved Performance of Students (TIPS) 2008-2010 (2 years)
Project Director: Dr. Edna Brabham
Auburn University

Composition, Comprehension, and Computation II and III 2006-2008 (2 years)
Project Director: Dr. Marian Parker
Troy University

Revitalizing Civics, Government and Economics Education- Southeast Alabama 2009-2011 (2 years)
Project Director: Dr. Dianne Gossett; Ms. Nadine Scarborough
Troy University

Helping Teachers to Help Students in Mathematics 2002-2004 (2 years)
Project Director: Ms. Mary Jane Turner
Birmingham Southern College

Utilizing an Inquiry Based Approach to Improve Science/Mathematics in Greene and Wilcox Counties 2006-2008 (2 years)
Project Directors: Dr. Mohammed Oazi; Dr. Carlton Morris
Tuskegee University

Alabama Reading Initiative (ALSDE) 2003-2004 (1 year)
Project Directors: Dr. Karen Foster; Dr. Wendell Thompson; Dr. Louanne Jacobs
Alabama A&M University

Project Director: Dr. Edna Brabham
Auburn University

Project Director: Dr. Lynne Mills
Auburn University-Montgomery

Project Director: Dr. Carol Uline
Jacksonville State University

Project Director: Dr. Jane W. Hawk
Troy University

Project Director: Dr. Maryann Manning
University of Alabama at Birmingham

Project Director: Dr. Kerry Rhone; Dr. Fieda Kalb
University of Montevallo

Project Director: Dr. Carolyn P. Casteel
University of South Alabama

Improving Teacher Quality: Mastery of Content-Teaching Writing 2003-2004 (1 year)
Project Directors: Dr. Rhonda Bowron; Dr. Susan Oliver
Troy University

Professional Development for Chemistry Teachers 2005-2006 (1 year)
Project Director: Dr. Jacqueline A. Nikles
University of Alabama at Birmingham

CORE (Collaborative Regional Education): Content Knowledge, Professional Development 2014-2015 (1 year)
Project Director: Dr. Alicia Simmons
Jacksonville State University

PARTNERSHIPS.

ACHE/Alabama State Department of Education (ALSDE): During this 15-year period $2,217,743 was set aside to support projects/initiatives administered by the ALSDE that were of high priority to the state of Alabama: The Alabama Reading Initiative (ARI) in the amount of $191,378 and the Alabama Mathematics, Science, and Technology Initiative (AMSTI) in the amount of $2,026,365. All funded projects were aligned with the "Twelve (12) Standards for Effective Professional Development in Alabama" adopted by the Alabama State Board of Education.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: Project Directors were highly successful in generating significant financial support as well as in-kind services to support their respective projects. The following roster represents funding partners as reported by the projects:

Alabama Department of Economic and Community Affairs (ADECA)
Alabama Gives Day
Alabama Humanities Foundation
Alabama LASER
Alabama Power Foundation
Alabama School for the Deaf
Alabama Shakespeare Festival
Alabama State Council for the Arts
Alabama State Department of Education
Alabama Technology in Motion
American Honda Foundation
Association for Supervision and Curriculum Development
Athens Bible College
Blue Cross-Blue Shield
Birmingham Botanical Gardens
Birmingham Public Library
Birmingham Museum of Art
Books-A-Million
Bowman Foundation
Buffalo Rock
Carolina Biological Supply Co.
Caring Foundation
Gadsden Center – University of Alabama
Gulf Coast Exploreum
Gulf Coast Hanger
Higher Ground Roasters
Hoover Foundation
John Lockett, Attorney
International Paper
Kathy G & Co.
Learning Tree
Leeds Optimist
Legacy, Inc.
Library of Congress
Lowder Family Foundation
Math Helper
McDowell Environmental Center
McWane Science Center
Mineral Information Institute
Mobile Museum of Art
Montgomery Museum of Fine Art
NASA
NASCO Science
National Science Foundation
Navy Reserve
Office Max

CCV Software
Central Alabama Community Foundation
Center for Archeological Studies
ChildCraft Educational Foundation of America
Chick-Fil-A
Civil Air Patrol
Concordia College – Selma
Corwin Press – Sage Publications
Cottage Hill Cleaners
Cultural Alliance of Greater Birmingham
Daniel Foundation
Delta Education
Domino's Pizza – Gadsden
Dothan Area Chamber of Commerce
Dry Cleaners of Mobile
"Economics America"
Educational Foundation of America
Engineering is Elementary
Fisher Scientific
Pearson Publishing
Publix Grocery
Rosen Classroom BooksSERVE, Inc.
Rutgers University
St. John's Episcopal Church
Southeast Center for Education in the Arts
Southern Museum of Flight
Temple Beth-Or
Tensor Foundation
The Private Eye®
Tom Snyder Software
Toyota
Tractor and Equipment
Trader Joe's
University of Alabama Press
Vulcan Park
Wal-Mart
"We the People"
Wright Attitudes
WHIL (Mobile)

PERFORMANCE OUTCOMES. Achieving ACHE state goals referenced earlier in this Report resulted in an annual average of more than 1,000 teachers, principals, and paraprofessionals participating in professional development across one hundred thirty-eight (138) school districts, eighty (80) of which were "high need districts". Such activities impacted an estimated 70,000 students each year.

A number of these projects attained national recognition: Alabama Hands-on Activity Science Program (ALAHASP); Alabama Math, Science, and Technology (AMSTI); Comprehensive Arts Education; Improving Physics and Chemistry Teaching in Secondary Education (IMPACTSEED); Physical Science in the 21st Century: Improving Teacher Quality and Mastery of Content (PS-21); Success Through Academic Research (STAR) Project: The Independent Study Scholarship Program; and University-School Partnership for Secondary Science (BIO-Teach).

Major factors contributing to achieving these state objectives were the funding stream, the integrity of the external evaluation process, and the partnerships. Most importantly, the quality of the projects was due to the Project Directors' leadership and their very capable staffs in the design, administration and delivery of professional development to teachers in all core subjects statewide. Part Two of this report provides an overview of annual performance outcomes for FY 2002-2003 through FY 2015-2016.

PART TWO

PERFORMANCE OUTCOMES: An Overview

FY 2002-2003 through FY 2015-2016

FY2002-2003 PROJECTS

FUNDING: ACHE awarded $1,131,538 of federal funds (NCLB) for projects in two categories. Eighteen (18) grants were awarded to twelve (12) Alabama public universities, a private college, and a private university.

Category A: $191,378 for the Alabama Reading Initiative Collaborative (eight projects);

Category B: $940,160 (10 projects) for mastery of content in subject areas of mathematics, science, foreign language, and the arts.

EXTERNAL EVALUATION:

Peer Review of Applications: Dr. Ann Jones (UWA) Chair

Alabama State Department of Education: *Dr. Katherine Mitchell; Dr. Susan Villaume; Dr. Mary Spor; Ms. Cassandra Wheeler; Ms. Pam Duke; and Ms. Katherine Elrod*

Classroom Teachers/Administrators: *Ms. Martha Chavers*

University Faculty/Administrators: *Dr. Larry Mullins (AUM)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: Alabama Reading Initiative (ARI). In collaboration with the Alabama State Department of Education, this program was designed to 1) increase reading achievement of students in ARI literacy demonstration sites; 2) increase literacy expertise of collaborative members, a professional faculty working in teacher education programs; 3) increase the expertise of an estimated 300 ARI reading coaches working with approximately 17,000 teachers and their students in ARI literacy demonstration sties; and 4) increase the expertise of undergraduate and graduate students enrolled in teacher education programs through improved curriculum and instruction. Grant recipients:

Institutions	***Project Director(s)***
Alabama A&M University	Drs. Karen Foster, Wendell Thompson, Louanne Jacobs
Auburn University	Dr. Edna Brabham
Auburn University-Montgomery	Dr. Lynne Mills
Jacksonville State University	Dr. Carol Uline
Troy University	Dr. Jane W. Hawk
University of Alabama at Birmingham	Dr. Maryann Manning
University of Montevallo	Drs. Kerry Rhone and Frieda Kalb
University of South Alabama	Dr. Carolyn P. Casteel

Category B: Mastery of Content. Included projects in core academic subjects to enhance student learning, including computer related technology. The projects were delivered to teachers and paraprofessionals as well as principals. Grant recipients:

Institutions	***Project Director(s)***
Auburn University	Dr. Chris Rodger
Birmingham Southern College	Ms. Mary Jane Turner
Jacksonville State University	Dr. Nouredine Zettili
Samford University	Dr. Deborah Childs-Bowen
Troy University-Dothan	Ms. Christina Johnson
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama in Huntsville	Dr. John Pottenger (2 grants)
University of Montevallo/ Alabama Humanities Foundation	Dr. Brent N. Halvonik; Mr. Tom Bryant
University of West Alabama/ Alabama Institute for Education in the Arts	Ms. Martha Lockett

PARTNERSHIPS:

ACHE/Alabama State Department of Education (ALSDE): In collaboration with the Alabama State Department of Education, $191,378 was awarded to the Alabama Reading Initiative (ARI) Collaborative, a project previously funded under the Dwight D. Eisenhower Professional Development Program. Eight (8) public universities serving all regions of the state offered this program. The Collaborative met monthly from September 2002 to May 2003.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,131,538 in federal funds, these projects reported an additional $1,174,332 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as American Honda Foundation and National Science Foundation, bringing the total funds supporting these projects to $2,305,870.

PERFORMANCE OUTCOMES: An estimated 1000 teachers, principals, and paraprofessionals representing 65 public school districts and 18 private schools participated directly in one or more of the eighteen (18) federally-funded projects. More than seven hundred (700) of these teachers served 49 public school districts identified by the Alabama State Department of Education as "high need." The ARI reading coaches who participated worked with an additional 17,000 teachers in over 450 ARI schools. Ninety-percent (90%) of professional development activities exceeded 80 hours of instruction during the school year from September 2003 through May 2004.

FY2003-2004 PROJECTS

FUNDING: ACHE awarded $1,249,226 of federal funds (NCLB) for projects in two categories. Thirteen (13) grants were awarded to eleven (11) Alabama public universities, a private college, and a private university.

Category A: $1,059,636 for Continuation of FY 2002-2003 Projects (10 projects); and

Category B: $189,590 for New Projects (3 projects)

EXTERNAL EVALUATION.

Peer Review of Applications: *Ms. Martha Chavers (Retired Teacher) Chair*

Alabama State Department of Education: *Drs. Catherine Moore; Anita T. Buckley-Commander;*

Classroom Teachers/Administrators: *Ms. Janis Wingate Stewart, Principal/Meadowview Elementary School (Selma); Ms. Cale Ebert, VP/Alabama council of Teachers of Mathematics (Baldwin County Board of Education)*

University Faculty/Administrators: *Drs. Charlotte Carter (Stillman*); *William Richardson (TU)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: Continuation of FY 2002-2003 Projects/Mastery of Content.

Institutions	***Project Director(s)***
Auburn University	Dr. Chris Rodger
Birmingham Southern College	Ms. Mary Jane Turner
Jacksonville State University	Dr. Nouredine Zettili
Samford University	Dr. Deborah Childs-Bowen
Troy University	Dr. Peter Howard; Mr. Tom Bryant
Troy University-Dothan	Ms. Christina Johnson
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama in Huntsville	Dr. John Pottenger (2 grants)
University of West Alabama/ Alabama Institute for Education in the Arts	Ms. Martha Lockett

Category B: New Projects/Mastery of Content.

Institutions	***Project Director(s)***
Alabama A&M University	Dr. Karen Foster; Dr. Mary Spor
Troy University	Dr. Judith F. Dye
University of South Alabama	Dr. Jeanette Fresne

PARTNERSHIPS:

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,249,226 in federal funds, these projects reported an additional $823,087 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: American Honda Foundation, Educational Foundation of America, Office Max, Walmart, ChildCraft Educational Foundation of America, Fischer Scientific, NASCO Science, Bowman Foundation, Blue Cross/Blue Shield, Alabama Humanities Foundation, Carolina Biological Supply Company, Rutgers University, Alabama State Council for the Arts, Rosen Classroom BooksSERVE, Inc., ADECA, and Gulf Coast Exploreum bringing the total funds supporting these projects to $2,072,313.

PERFORMANCE OUTCOMES: An estimated 900 teachers and forty-three (43) representing 82 public school districts and 15 private schools, participated directly in one or more of the thirteen (13) federally-funded projects. Seven hundred (700) of these teachers served 78 public school districts identified by the Alabama State Department of Education as "high need." An estimated 21,000 students were directly impacted by the teaching. Thirty-percent (30%) of professional development activities exceeded 80 hours of instruction; eighty-five (85%) exceeded 40 hours of instruction extended over a 10-month period.

FY2004-2005 PROJECTS

FUNDING: ACHE awarded $1,213,657 of federal funds (NCLB) for projects in two categories. Ten (10) grants were awarded to seven (7) Alabama public universities and a private university.

Category A: $1,035,157 for Continuation of FY 2003-2004 (eight projects); and

Category B: $ 178,500 for New Projects (two projects)

EXTERNAL EVALUATION.

Peer Review of Applications: *Ms. Martha Chavers (Retired Teacher) Chair*

Alabama State Department of Education: *Ms. Cyndi Hill Townley*

Alabama Teacher of the Year: *Ms. Cynda Fickert*

University Faculty/Administrators: *Dr. John Vickers (A&M); Dr. Janet Warren (AUM)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: Continuation of FY 2003-2004 Projects/Mastery of Content.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili
Samford University	Dr. Deborah Childs-Bowen
Troy University	Dr. Peter Howard; Mr. Tom Bryant
Troy University-Dothan	Ms. Christina Johnson
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama in Huntsville	Dr. John Pottenger (2)
University of South Alabama/ Alabama Institute for Education in the Arts	Dr. Jeanette Fresne Ms. Martha Lockett

Category B: New Projects/Mastery of Content.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Delisa Dismukes
University of Alabama at Birmingham	Dr. Mary Williams

PARTNERSHIPS:

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional

and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,213,657 in federal funds, these projects reported an additional $1,200,000 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Books-a Million, CCV Software, Office Max, Tom Snyder Software, American Honda Corporation, Birmingham Botanical Gardens, Carolina Biological Supply Company, Delta Education, Learning Tree, Association for Supervision and Curriculum Development, Rosen Classroom BooksSERVE, Inc., Gadsen Center, and McWane Science Center, bringing the total funds supporting these projects to $2,413,657.

PERFORMANCE OUTCOMES: Nine-hundred (900) teachers, forty-three (43), administrators, and 8 paraprofessionals representing 82 public school districts and 15 private schools participated directly in one or more of the thirteen (13) federally-funded projects. Seven hundred (700) of these teachers served 78 public school districts identified by the Alabama State Department of Education as "high need." An estimated 21,000 students were directly impacted by the teaching. Thirty-percent (30%) of professional development activities exceeded 80 hours of instruction; eighty-five (85%) percent exceeded forty (40) hours of instruction extended over a ten (10) month period.

FY2005-2006

FUNDING: ACHE awarded $1,163,984 of federal funds (NCLB) for projects in two categories. Ten (10) grants were awarded to seven (7) institutions: six (6) Alabama public universities and one (1) private university.

Category A: $1,057,672 for Continuation of FY 2004-2005 (eight projects); and

Category B: $ 106,312 for New Projects (two projects)

EXTERNAL EVALUATION.

Peer Review of Applications: *Ms. Martha Chavers (Retired Teacher) Chair*

Alabama State Department of Education: *Dr. Anita T. Buckley-Commander*

Alabama Teacher of the Year: *Ms. Margaret Petty*

University Faculty/Administrators: *Dr. Vagn K. Hansen (UNA); Dr. Cynthia Harper (JSU); Dr. Michael A. Cooke (UWA); Dr. Sandra Lee Jones (TU-Dothan); Dr. Benjamin Benford (Tuskegee); Dr. Edward L. Shaw (USA)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

ACHE Statewide Evaluation: ACHE contracted with the Center of Educational Accountability (CEA) of the University of Alabama at Birmingham (UAB) to initiate a three-year study of NCLB projects to measure the effectiveness of activities designed to provide "long term, sustained, high quality professional development for Alabama K-12 teachers statewide, particularly in "high-need school systems." [5]

PROJECTS/Category A: Continuation of FY 2004-2005 Projects/Mastery of Content. All core subjects were again included in four content categories: (1) science and mathematics, (2) humanities and social science, (3) arts education, and (4) independent study/research.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili
Samford University	Dr. Deborah Childs-Bowen
Troy University-Dothan	Ms. Christina Johnson; Ms. Sandy Armstrong
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. Mary Williams
University of Alabama in Huntsville	Dr. John Pottenger (2)
University of South Alabama/ Alabama Institute for Education in the Arts	Dr. Jeanette Fresne Ms. Martha Lockett

[5] CEA project evaluators were Dr. Scott Snyder, Dr. Marcia O'Neal, and Dr. Stephanie Baird

Category B: New Projects/Mastery of Content.

Institutions	*Project Director(s)*
Auburn University	Dr. Chris Rodger
University of Alabama at Birmingham	Dr. Jacqueline A. Nikles

PARTNERSHIPS:

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,163,984 in federal funds, these projects reported an additional $853,689 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Alabama Power Foundation, American Honda Foundation, Alabama Shakespeare Festival, Birmingham Botanical Gardens, Birmingham Public Library, Corwin Press-Sage Publications, Cultural Alliance of Greater Birmingham, Chick-Fil-A, Delta Education, Domino's Pizza-Gadsden, Dothan Area Chamber of Commerce, Legacy, Inc., Math Helper, Montgomery Museum of Fine Arts, McWane Science Center, NASA, Carolina Biological Supply Company, Tennessee Department of Education, John Lockett/Attorney, Southeast Center for Education in the Arts, and Alabama State Council for the Arts bringing the total funds supporting these projects to $2,017,673.

PERFORMANCE OUTCOMES: Over eight-hundred (898) teachers, twenty-five (25) administrators, and eight (8) para-professionals representing 76 public school districts and 15 private schools participated directly in one or more of the ten (10) federally-funded projects. Five hundred (500) of these teachers served 44 public school districts identified by the Alabama State Department of Education as "high need." An estimated 51,400 students were directly impacted by the teaching. Thirty-percent (30%) of professional development activities exceeded 80 hours of instruction; fifty percent (50%) exceeded forty (40) hours of instruction extended over a twelve (12) month period.

FY2006-2007

FUNDING: ACHE awarded $1,148,604 of federal funds (NCLB) for projects in two categories. Ten (10) grants were awarded to eight (8) institutions: seven (7) Alabama public universities and one (1) private university:

Category A: $ 1,022,446 for Continuation of FY 2005-2006 (eight projects); and

Category B: $ 126,158 for New Projects (two projects)

EXTERNAL EVALUATION

Peer Review of Applications: *Ms. Nancy Vawter, Chair*

Alabama State Department of Education: Ms. Audrie Bradford

Alabama Teacher of the Year: *Ms. Cameron McKinley; Ms. Cynda Fickert*

University Administrators and Faculty*: Dr. Benjamin Benford (Tuskegee);*

Dr. Edward L. Shaw, Jr., (USA); Dr. Cynthia Harper (JSU); Dr. Vagn K. Hansen (UNA)

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

ACHE Statewide Evaluation: ACHE contracted with the Center of Educational Accountability (UAB) to initiate a three-year study of NCLB projects to measure the effectiveness of activities designed to provide "long term, sustained, high quality professional development for Alabama K-12 teachers statewide, particularly in "high-need school systems."[6] The first report (FY 2005-2006) was issued in June 2007.

PROJECTS/Category A: Continuation of FY 2005-2006 Projects/Mastery of Content. All core subjects were again included in four content categories: (1) science and mathematics, (2) humanities and social science, (3) arts education, and (4) independent study/research.

Institutions	***Project Director(s)***
Auburn University	Dr. Chris Roger
Jacksonville State University	Dr. Nouredine Zettili
Troy University-Dothan	Ms. Christina Johnson; Ms. Sandy Armstrong
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. John Pottenger (2)
University of South Alabama/ Alabama Institute for Education in the Arts	Dr. Jeanette Fresne Ms. Martha Lockett

[6] CEA project evaluators were Dr. Scott Snyder, Dr. Marcia O'Neal, and Dr. Stephanie Baird

Category B: New Projects/Mastery of Content.

Institutions	*Project Director(s)*
Tuskegee University	Dr. Carolyn Gathright; Dr. Carlton Morris
Troy University	Dr. Marian Parker

PARTNERSHIPS:

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,148,604 in federal funds, these projects reported an additional $1,455,388 of in-kind contributions from the institutions and school districts as well as external funding such companies, foundations, federal agencies, and business as: Alabama LASER; Alabama Power Foundation, American Honda Foundation, Alabama Shakespeare Festival, Birmingham Botanical Gardens, Chik-Fil-A, Delta Education, Gulf Coast Exploreum, McWane Science Center, Mineral Information Institute, Montgomery Museum of Fine Arts, NASA, Publix, Rosen Classroom BookSERVE, Inc., Carolina Biological Supply, Wright Attitudes, WHIL (Mobile), John Lockett/Attorney, Southeast Center for Education in the Arts, Athens Bible College, and Alabama State Council for the Arts, bringing the total funds supporting these projects to $2,603,992.

PERFORMANCE OUTCOMES: An estimated seven-hundred fifty-three (753) teachers, thirty-eight (38) administrators, and twelve (12) para-professionals representing 82 public school districts and 19 private schools participated directly in one or more of the ten (10) federally-funded projects. Three-hundred eighty-nine (389) of these teachers served 45 public school districts identified by the Alabama State Department of Education as "high need." An estimated 50,700 students were directly impacted by the teaching. Two projects exceeded 80 hours of instruction; eighty percent (80%) exceeded forty (40) hours of instruction which extended over four (4) to twelve (12) months.

FY2007-2008

FUNDING: ACHE awarded $1,187,000 of federal funds (NCLB) for projects in two categories. Eleven (11) grants were awarded to eight (8) institutions: seven (7) Alabama public universities and one (1) private university.

Category A: $ 1,057,000 for Continuation of FY 2006-2007 Projects (nine projects); and

Category B: $ 130,000 for New Projects (two projects)

EXTERNAL EVALUATION

Peer Review of Applications: *Ms. Nancy Vawter, Chair*

Alabama State Department of Education: *Ms. Audrie Bradford*

University Administrators and Faculty*: Dr. Cynthia Harper (JSU); Dr. Benjamin Benford (Tuskegee); Dr. Edward L. Shaw, Jr. (USA); Dr. Jack Riley (UM)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

ACHE Statewide Evaluation: ACHE contracted with the Center of Educational Accountability (UAB) to initiate a three-year study of NCLB projects to measure the effectiveness of activities designed to provide "long term, sustained, high quality professional development for Alabama K-12 teachers statewide, particularly in "high-need school systems."[7] The third report (FY 2007-2008) was issued in July 2009. A three-year cumulative report was issued in August 2009.

PROJECTS/Category A: Continuation of FY 2006-2007 Projects/Mastery of Content. All core subjects were again included in four content categories: (1) science and mathematics, (2) humanities and social science, (3) arts education, and (4) independent study/research.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili
Troy University	Dr. Rhonda Bowron; Dr. Susan Oliver
Troy University-Dothan	Ms. Sandy Armstrong
Tuskegee University	Dr. Mohammed Qazi; Dr. Carlton Morris
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. John Pottenger (2)

[7] CEA project evaluators were Dr. Scott Snyder, Dr. Marcia O'Neal, and Dr. Stephanie Baird

University of South Alabama/	Dr. Jeanette Fresne
Alabama Institute for Education in the Arts	Ms. Linda Dean

Category B: New Projects/Mastery of Content.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Jan Wilson
University of Alabama	Dr. Dennis Sunal

PARTNERSHIPS:

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,187,000 in federal funds, these projects reported an additional $1,434,588 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Civil Air Patrol, NASA, Navy Reserve, Alabama Power Foundation, Birmingham Botanical Gardens, Delta Education, McDowell Environmental Center, Carolina Biological Supply Company, McWane Science Center, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama Department of Economic and Community Affairs (ADECA), Alabama State Council for the Arts, John Lockett/Attorney, Chick-Fil-A, and Southeast Center for Education in the Arts, bringing the total funds supporting these projects to $2,621,588.

PERFORMANCE OUTCOMES: An estimated seven-hundred forty-seven (747) teachers, forty-nine (49) administrators, and six (6) para-professionals representing 83 public school districts and 23 private schools participated directly in one or more of the eleven (11) federally-funded projects. Three-hundred eighty-nine (389) of these teachers served 52 public school districts identified by the Alabama State Department of Education as "high need." An estimated 45,000 students were directly impacted by the teaching. Three projects exceeded 80 hours of instruction; seventy-three (73%) exceeded forty (40) hours of instruction which extended over nine (9) to eighteen (18) months.

FY2008-2009

FUNDING: ACHE awarded $1,195,000 of federal funds (NCLB) for projects in three categories. Nine (9) grants were awarded to seven (7) public institutions.

Category A: $ 230,000 for Alabama Math Science Technology Initiative (AMSTI) (1 projects);
Category B: $ 867,000 for Continuation of FY 2007-2008 Master of Content Projects (7 projects);
Category C: $ 98,000 for New Projects (1 project)

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Cynthia Harper (JSU) Chair*

Alabama State Department of Education: *Ms. Audrie Bradford*
Alabama Teacher of the Year*: Mr. Roy Hudson*
Classroom Teachers and School Administrators*: Ms. Christine H. Nassar*
University Administrators and Faculty**:** *Dr. Jack Riley (UM); Dr. Sandra Enger (UAH); Dr. Martha Hocutt (UWA)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: This project was designed to implement professional learning teams (PLT) in participating AMSTI schools and to build the leadership potential of AMSTI lead teachers. PLT activities included examining student work, participating in a lesson study, or participating in a book study to improve teacher knowledge of core academic subjects and increase student performance. A PLT expert conducted one-day training with AMSTI schools with the administrators and two lead teachers.

Institutions	***Project Director(s)***
University of North Alabama	Ms. Shelly Hollis

Category B: Continuation of FY 2007-2008 Mastery of Content Projects.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili
Jacksonville State University	Dr. Jan Case
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. John Pottenger
University of South Alabama/	Dr. Jeanette Fresne

Alabama Institute for Education in the Arts	Ms. Linda Dean

Category C: New Projects

Institution	***Project Director***
Auburn University	Dr. Edna Brabham

PARTNERSHIPS:

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,195,000 in federal funds, these projects reported an additional $1,152,812 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Birmingham Botanical Gardens, Birmingham Museum of Art, Carolina Biological Supply Company, McWane Science Center, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Chik-Fil-A, Gulf Coast Hanger, Cottage Hill Cleaners, Alabama State Council for the Arts, Alabama Power Foundation, Southeast Center for Education in the Arts, Temple Beth Or, St. John's Episcopal Church bringing the total funds supporting these projects to $2, 347,812.

PERFORMANCE OUTCOMES: An estimated eight-hundred eighty-five (885) teachers, one hundred thirty (130) administrators, and four (4) para-professionals representing 101 public school districts and 20 private schools participated directly in one or more of the nine (9) federally-funded projects. Three-hundred sixty-two (362) of these teachers served 54 public school districts identified by the Alabama State Department of Education as "high need." An estimated 65,000 students were directly impacted by the teaching. Three projects exceeded 80 hours of instruction; six projects exceeded thirty (30) hours of instruction which extended over seven (7) to eighteen (18) months with an average just over 11 months of project activity.

FY2009-2010

FUNDING: ACHE awarded $1,282,448 of federal funds (NCLB) for projects in three categories. Ten (10) grants were awarded to seven (7) public institutions.

Category A: $ 206,928 for Alabama Math Science Technology Initiative (AMSTI) (1 project);
Category B: $ 980,520 for Continuation of FY 2008-2009 Master of Content Projects (8 projects);
Category C: $ 95,000 for New Projects (1 project)

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Martha Hocutt, (UWA) Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Sheila V. Patterson*
Alabama Teacher of the Year*: Mr. Roy Hudson*
University Administrators and Faculty: *Dr. William S. Richardson (TU)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI project provided professional development for Lead Teachers trained and chosen from among AMSTI schools in three AMSTI regions: Jacksonville State University, Athens State University, and University of South Alabama. Two "Phases" of the project were implemented: Phase I schools provided oversight and support in developing sustainable Professional Learning Teams for their faculty; Phase II AMSTI Lead Teachers provided content specific professional development for the Professional Learning Teams under their leadership. The project built on earlier work conducted by the University of North Alabama in the previous year.

Institution	***Project Director(s)***
Jacksonville State University	Dr. William Carr; Ms. Tanya Barnes

Category B: Continuation of FY 2008-2009 Mastery of Content Projects.

Institutions	***Project Director(s)***
Auburn University	Dr. Edna Brabham
Jacksonville State University	Dr. Nouredine Zettili
Jacksonville State University	Dr. Jordan Barkley
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. John Pottenger
University of South Alabama/	Dr. Jeanette Fresne

Alabama Institute for Education in the Arts Ms. Linda Dean

Category C: New Projects

Institutions	***Project Director(s)***
Troy University	Dr. Dianne Gossett; Ms. Nadine Scarborough

PARTNERSHIPS:

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,282,448 in federal funds, these projects reported an additional $1,515,673 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: "We the People," "Economics America," Library of Congress, Alabama Power Foundation, Birmingham Botanical Gardens, Buffalo Rock, Carolina Biological Supply Company, The Private Eye, Vulcan Park, McWane Science Center, Gulf Coast Hanger, Cottage Hill Cleaners, Daniel Foundation, Central Alabama Community Foundation, American Honda Foundation, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama State Council for the Arts, Alabama Humanities Foundation, and Southeast Center for Education in the Arts bringing the total funds supporting these projects to $2,798,121.

PERFORMANCE OUTCOMES: An estimated one thousand, one hundred sixty-two (1,162) teachers, one hundred (100) administrators, and eighteen (18) para-professionals representing 87 public school districts and 10 private schools participated directly in one or more of the ten (10) federally-funded projects. One thousand (1,000) of these teachers served 70 public school districts identified by the Alabama State Department of Education as "high need." An estimated 77,000 students were directly impacted by the teaching. Three projects exceeded eighty (80) hours of instruction; six of ten (10) projects exceeded forty (40) hours of instruction which extended over nine (9) to sixteen (16) months with an average of about 12.5 months of project activity.

FY2010-2011

FUNDING: ACHE awarded $1,242,485 of federal funds (NCLB) for projects in three categories. Ten (10) grants were awarded to eight (8) public institutions.

Category A: $ 210,000 for Alabama Math Science Technology Initiative (AMSTI) (1 project);
Category B: $ 962,485 for Continuation of FY 2009-2010 Master of Content Projects (8 projects);
Category C: $ 70, 000 for New Projects (1 project)

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Martha Hocutt, (UWA) Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Sheila V. Patterson*
Alabama Teacher of the Year*: Mr. Phil Rodney Wilson*
Classroom Teachers and School Administrators*: Dr. Catherine Shields*
University Administrators and Faculty: *Dr. Jennifer A Brown (AU)*
Independent Professional Evaluator: *Dr. Gypsy Abbott (UAB)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI project provided professional development for Lead Teachers trained and chosen from among AMSTI schools in three AMSTI regions: Jacksonville State University, Athens State University, and University of South Alabama. Two "Phases" of the project were implemented: Phase I schools provided oversight and support in developing sustainable Professional Learning Teams for their faculty; Phase II AMSTI Lead Teachers provided content specific professional development for the Professional Learning Teams under their leadership. The project built on earlier work conducted by the University of North Alabama in the previous year.

Institution	***Project Director(s)***
Jacksonville State University	Dr. Jordan Barkley; Ms. Tanya Barnes

Category B: Continuation of FY 2009-2010 Mastery of Content Projects.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Jordan Barkley; Ms. Sharon Padgett
Snead State Community College	Dr. Nouredine Zettili
Troy University	Dr. Dianne Gossett; Ms. Nadine Scarborough
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford

University of Alabama at Birmingham	Dr. J. Michael Wyss; Mr. Kevin Jarrett
University of Alabama in Huntsville	Dr. John Pottenger
University of South Alabama/	Dr. Jeanette Fresne
Alabama Institute for Education in the Arts	Ms. Linda Dean

Category C: New Projects

Institution	***Project Director***
Troy University-Dothan	Dr. Vijaya Gompa; Dr. Shawn Plash*)*

PARTNERSHIPS:

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,242,485 in federal funds, these projects reported an additional $934,689 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: "We the People," "Economics America," Alabama Power Foundation, Birmingham Botanical Gardens, Buffalo Rock, Kathy G and Company, McWane Science Center, Carolina Biological Supply Company, Southern Museum of Flight, University of Alabama Press, Daniel Foundation, Central Alabama Community Foundation, International Paper, Blue Cross/Blue Shield, Mobile Museum of Art, Cottage Hill Cleaners, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama LASER, Alabama State Council for the Arts, Alabama Technology in Motion, Concordia College-Selma, and Southeast Center for Education in the Arts bringing the total funds supporting these projects to $2,177,174.

PERFORMANCE OUTCOMES: An estimated one thousand, two hundred fifty-two (1,252) teachers, one hundred one (101) administrators, and twenty-eight (28) para-professionals representing 94 public school districts and 17 private schools participated directly in one or more of the ten (10) federally-funded projects. An estimated one thousand (1,000) of these teachers served 58 public school districts identified by the Alabama State Department of Education as "high need." An estimated 63,000 students were directly impacted by the teaching. Four (4) projects exceeded eighty (80) hours of instruction; four (4) projects exceeded forty (40) hours of instruction which extended over nine (9) to eighteen (18) months. The remaining projects offered professional development up to 39 hours.

FY2011-2012

FUNDING: ACHE awarded $1,021,418 of federal funds (NCLB) for projects in two categories. Nine (9) grants were awarded to eight (8) public institutions.

Category A: $ 200,000 for Alabama Math Science Technology Initiative (AMSTI) (2 projects);

Category B: $ 821, 418 for Continuation of FY 2010-2011 Master of Content Projects (7 projects);

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Catherine Shields, Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Sheila V. Patterson; Ms. Martha Lockett*

Alabama Teacher of the Year*: Dr. Gay F. Barnes*

University Administrators and Faculty: *Dr. Kevin A. Rollen (A&M)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI Lead Teacher Enhancement Project in collaboration with the Alabama State Department of Education was designed to accomplish two (2) primary purposes: 1) Establish and implement Professional Learning (PLTs) and 2) Provide professional development for the PLTs in aligning the AMSTI and resource materials with the Alabama Course of Study Standards. The goal was to develop sustained leadership by empowering and enhancing the leadership potential of lead teachers in AMSTI schools. The project continued to build on earlier work conducted by the University of North Alabama and the AMSTI Lead Teacher Enhancement Project during the previous year two years by Jacksonville State University.

Institutions	***Project Director(s)***
Athens State University	Dr. Debra Baird; Ms. Joyce Waid; Ms. Carrie Lin
Jacksonville State University	Dr. Jordan Barkley; Ms. Tanya Barnes

Category B: Continuation of FY 2010-2011 Mastery of Content Projects.

Institutions	***Project Director(s)***
Snead State Community College	Dr. Nouredine Zettili
Troy University-Dothan	Dr. Vijaya Gompa; Dr. Shawn Plash
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. Joseph Burns; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss

University of Alabama in Huntsville	Dr. John Pottenger
University of South Alabama/	Dr. Jeanette Fresne;
Alabama Institute for Education in the Arts	Ms. Martha Lockett

PARTNERSHIPS:

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $1,021,418 in federal funds, these projects reported an additional $853,222 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Alabama Power Foundation, Birmingham Botanical Gardens, McWane Science Center, Carolina Biological Supply Company, Daniel Foundation, International Paper, Blue Cross/Blue Shield, Mobile Museum of Art, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama Technology in Motion bringing the total funds supporting these projects to $1,874,640.

PERFORMANCE OUTCOMES: An estimated five-hundred fifty-five (555) teachers, fifty-five (55) administrators, and four (4) para-professionals representing 61 public school districts and 12 private schools participated directly in one or more of the nine (9) federally-funded projects. An estimated five hundred (500) of these teachers served 37 public school districts identified by the Alabama State Department of Education as "high need." An estimated 67,000 students were directly impacted by the teaching. Three (3) projects exceeded eighty (80) hours of instruction; six (6) projects exceeded forty (40) hours of instruction which extended one (1) to eighteen (18) months, an average of 10.4 months of project activity.

FY2012-2013

FUNDING: ACHE awarded $969,570 of federal funds (NCLB) for projects in two categories. Ten (10) grants were awarded to eight (8) public institutions.

Category A: $ 250,000 for Alabama Math Science Technology Initiative (AMSTI) (3 projects);

Category B: $ 719,570 for Continuation of FY 2011-1012 Master of Content Projects (7 projects);

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Catherine Shields, Shades Valley High School, Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Sheila V. Patterson;*

Alabama Teacher of the Year*: Ms. Suzanne Culbreth*

University Administrators and Faculty: *Dr. Celia Rudolph (Huntingdon); Dr. Kevin Rollen (A&M)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI Lead Teacher Enhancement Project in collaboration with the Alabama State Department of Education was designed to accomplish two (2) primary purposes: 1) Establish and implement Professional Learning (PLTs) and 2) Provide professional development for the PLTs in aligning the AMSTI and resource materials with the Alabama Course of Study Standards. The goal was to develop sustained leadership by empowering and enhancing the leadership potential of lead teachers in AMSTI schools.

Institutions	***Project Director(s)***
Athens State University	Ms. Carrie Lin
Jacksonville State University	Dr. Kelly Ryan; Ms. Tanya Barnes
University of Alabama at Huntsville	Ms. Carol Mueller

Category B: Continuation of FY 2011-2012 Mastery of Content Projects.

Institutions	***Project Director(s)***
Snead State Community College	Dr. Nouredine Zettili
Troy University-Dothan	Dr. Vijaya Gompa; Dr. Shawn Plash
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. j. Michael Wyss; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. John Pottenger
University of South Alabama/ Alabama Institute for Education in the Arts	Dr. Jeanette Fresne; Ms. Martha Lockett

PARTNERSHIPS.

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $969,570 in federal funds, these projects reported an additional $724,863 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Hoover Foundation, Private Eye; McWane Science Center, Carolina Biological Supply Company, Tractor and Equipment; Daniel Foundation, International Paper, Blue Cross/Blue Shield, Lowder Family Foundation, Mobile Museum of Art, Dry Cleaning in Mobile, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama State Council for the Arts, Alabama Technology in Motion, Concordia College-Selma and Southeast Center for Education in the Arts bringing the total funds supporting these projects to $1,694,433.

PERFORMANCE OUTCOMES. An estimated eight-hundred thirty-two (832) teachers, forty-eight (48) administrators, and three (3) para-professionals representing 56 public school districts and 13 private schools participated directly in one or more of the ten (10) federally-funded projects. An estimated eight hundred (800) of these teachers served 36 public school districts identified by the Alabama State Department of Education as "high need." An estimated 49,000 students were directly impacted by the teaching. Three (3) projects exceeded eighty (80) hours of instruction; six (6) projects exceeded forty (40) hours of instruction which extended one (1) to eighteen (18) months, an average of 11.2 months of project activity.

FY2013-2014

FUNDING: ACHE awarded $943,642 of federal funds (NCLB) for projects in two categories. Ten (10) grants were awarded to seven (7) public institutions.

Category A: $ 210,000 for Alabama Math Science Technology Initiative (AMSTI) (3 projects);

Category B: $ 733,642 for Continuation of FY 2012-1013 Master of Content Projects (7 projects);

EXTERNAL EVALUATION

Peer Review of Applications: *Martha Hocutt (UWA), Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Sheila V. Patterson;*

Alabama Teacher of the Year*: Ms. Tracy Pruitt*

University Administrators and Faculty: *Dr. James F. Rinehart (TU); Dr. Celia Rudolph (Huntingdon)*

Independent Professional Evaluator: *Dr. Richard Littleton*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI Lead Teacher Enhancement Project in collaboration with the Alabama State Department of Education was designed to accomplish three (3) primary purposes: 1) Provide professional development for Lead Teachers; 2) Provide a higher level of mastery of math and science content in their schools; and 3) Promote alignment of AMSTI curriculum and resource materials with the Alabama Course of Study Standards.

Institutions	***Project Director(s)***
Athens State University	Ms. Carrie Lin
Jacksonville State University	Dr. Kelly Ryan; Ms. Tanya Barnes
University of Alabama at Huntsville	Dr. James Miller; Ms. Carol Mueller

Category B: Continuation of FY 2012-2013 Mastery of Content Projects.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili; Dr. Noureddine Bekhouche
Troy University-Dothan	Dr. Vijaya Gompa
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. J. Michael Wyss; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. John Pottenger
University of South Alabama/	Dr. Jeanette Fresne;

Alabama Institute for Education in the Arts Ms. Martha Locket

PARTNERSHIPS.

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $943,642 in federal funds, these projects reported an additional $589,933 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Birmingham Botanical Gardens, Private Eye, McWane Science Center, Carolina Biological Supply Company, Center for Archeological Studies, Daniel Foundation, International Paper, Caring Foundation, Lowder Family Foundation; Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama State Council for the Arts, Alabama Technology in Motion, and Southeast Center for Education in the Arts bringing the total funds supporting these projects to $1,533,575.

PERFORMANCE OUTCOMES. An estimated one thousand one hundred fifty (1,150) teachers, forty-six (46) administrators, and three (3) para-professionals representing 67 public school districts and 13 private schools participated directly in one or more of the ten (10) federally-funded projects. An estimated one thousand (1,000) of these teachers served 43 public school districts identified by the Alabama State Department of Education as "high need." An estimated 63,000 students were directly impacted by the teaching. Three (3) projects exceeded eighty (80) hours of instruction; six (6) projects exceeded forty (40) hours of instruction which extended one (1) to ten (10) months, an average of 10.7 months of project activity.

FY2014-2015

FUNDING: ACHE awarded $943,505 of federal funds (NCLB) for projects in three categories. Thirteen (13) grants were awarded to nine (9) public institutions.

Category A: $ 235,000 for Alabama Math Science Technology Initiative (AMSTI) (5 projects);
Category B: $ 676,505 for Continuation of FY 2013-1014 Master of Content Projects (7 projects);
Category C: $ 32,000 for New Project (1 project).

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Martha Hocutt (UWA), Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Sheila V. Patterson*
University Administrators and Faculty**:** *Dr. Jack Riley (UM); Dr. James F. Rinehart (TU); Dr. Katie Cole Kinney (UNA)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI Lead Teacher Enhancement Project in collaboration with the Alabama State Department of Education was designed to accomplish three (3) primary purposes: 1) Provide professional development for Lead Teachers; 2) Promote a higher level of mastery of math and science content in their schools; and 3) Promote alignment of AMSTI curriculum and resource materials with the Alabama Course of Study Standards.

Institutions	***Project Director(s)***
Athens State University	Ms. Carrie Lin
Auburn University	Ms. Mary Lou Ewald; Ms. Elizabeth Hickman
Jacksonville State University	Dr. Eric Lee; Ms. Kay Johnson
University of Alabama at Huntsville	Dr. James Miller; Ms. Carol Mueller
Wallace Community College-Selma/ Alabama State University	Mr. Clarence Pettway

Category B: Continuation of FY 2013-2014 Mastery of Content Projects.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili; Dr. Noureddine Bekhouche
Troy University-Dothan	Dr. Vijaya Gompa
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. J. Michael Wyss; Ms. Katie Busch; Ms. Kay Garcia; Ms. Joan Dawson; Ms. Beverly Radford

University of Alabama at Birmingham	Dr. J. Michael Wyss
University of Alabama in Huntsville	Dr. Andrea Word
University of South Alabama/	Dr. Jeanette Fresne; Ms. Jessica Freeland
Alabama Institute for Education in the Arts	Ms. Martha Lockett; Mr. Randy Foster

Category C: New Project

Jacksonville State University	Dr. Alicia Simmons

PARTNERSHIPS.

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $943,505 in federal funds, these projects reported an additional $2,310,326 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Tensor Foundation, Birmingham Botanical Gardens, Private Eye, Engineering is Elementary, McWane Science Center, Carolina Biological Supply Company, Center for Archeological Studies, International Paper, Caring Foundation, Lowder Family Foundation, Concordia College-Selma, Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, bringing the total funds supporting these projects to $3,253,831.

PERFORMANCE OUTCOMES. An estimated one thousand four hundred forty-eight (1,448) teachers, ninety-three (93) administrators, and five (5 para-professionals representing 73 public school districts and 21 private schools participated directly in one or more of the thirteen (13) federally-funded projects. An estimated one thousand (1,000) of these teachers served 80 public school districts identified by the Alabama State Department of Education as "high need." An estimated 88,000 students were directly impacted by the teaching. Three (3) projects exceeded eighty (80) hours of instruction; seven (7) projects exceeded forty (40) hours of instruction which extended from seven (7) to twelve (12) months, an average of 10.5 months of project activity.

FY2015-2016

FUNDING: ACHE awarded $941,525 of federal funds (NCLB) for projects in two categories. Twelve (12) grants were awarded to ten (10) public institutions.

Category A: $ 265,000 for Alabama Math Science Technology Initiative (AMSTI) (5 projects);

Category B: $ 676,525 for Continuation of FY 2014-1015 Master of Content Projects (7 projects);

EXTERNAL EVALUATION

Peer Review of Applications: *Dr. Jack Riley (UM) Chair*

Alabama State Department of Education: *Ms. Audrie Bradford; Ms. Kristie Taylor*

Alabama Teacher of the Year: *Ms. Jennifer Brown*

University Administrators and Faculty: *Dr. Michael Burger (AUM); Dr. Reeney R. H. Rogers (UWA)*

Annual Project Evaluation: A critical component of the ACHE administered NCLB program was the ongoing evaluation of project activities conducted by an external evaluator (an agency or expert in professional development of the project's field(s) of study). Reports were submitted annually and included in the Project Director's final report to the ACHE.

PROJECTS/Category A: The AMSTI Lead Teacher Enhancement Project in collaboration with the Alabama State Department of Education was designed to accomplish three (3) primary purposes: 1) Provide professional development for Lead Teachers; 2) Promote a higher level of mastery of math and science content in their schools; and 3) Promote alignment of AMSTI curriculum and resource materials with the Alabama Course of Study Standards

Institutions	***Project Director(s)***
Athens State University	Ms. Carrie Lin
Auburn University	Ms. Mary Lou Ewald; Elizabeth Hickman
Troy University	Ms. Kimberly Dove; Ms. Sherrie Blackmon
University of Alabama at Huntsville	Dr. James Miller; Ms. Carolyn Pistorius
Wallace Community College-Selma/ Alabama State University	Mr. Clarence Pettway

Category B: Continuation of FY 2014-2015 Mastery of Content Projects.

Institutions	***Project Director(s)***
Jacksonville State University	Dr. Nouredine Zettili; Dr. Noureddine Bekhouche
Troy University-Dothan	Dr. Vijaya Gompa; Ms. Diane Porter
University of Alabama	Dr. Dennis Sunal
University of Alabama at Birmingham	Dr. J. Michael Wyss; Ms. Katie Busch; Ms. Kay Garcia; Ms. Joan Dawson; Ms. Beverly Radford
University of Alabama at Birmingham	Dr. J. Michael Wyss; Dr. Kevin Jarrett

University of Alabama in Huntsville	Dr. Andrea Word
University of South Alabama/	Dr. Jeanette Fresne; Ms. Jessica Freeland
Alabama Institute for Education in the Arts	Ms. Martha Lockett; Mr. Randy Foster

PARTNERSHIPS.

ACHE/Alabama State Department of Education (ALSDE): The goal of collaboration with the Alabama State Department of Education was: 1) to provide professional development for Professional Learning Teams (PLTs) at established sites and 2) to facilitate the work of Lead Teachers designated to implement the Alabama Math, Science, and Technology Initiative (AMSTI).

AMSTI was designed by a Blue Ribbon committee composed of Grade K-12 educators, higher education representatives, and business leaders. Following approval by the Alabama State Board of Education in 2000, eleven (11) AMSTI sites were established, one (1) within the geographical region defined by the Alabama Regional In-service Center. Implementation of AMSTI included providing schools with resources, professional development, and on-site support to ensure that all students developed the skills necessary for success in postsecondary education and for careers in the workforce.

Intra-Institutional and Institutional-District: Federal legislation stipulated that all grants awarded to higher education institutions were required to show evidence of participation by "eligible partnerships" including, but not limited to the division of the institution that prepares teachers and principals, a school of arts and sciences, and a high-need local education agency. These intra-institutional and institutional-district partnerships made significant contributions in terms of providing facilities, project staff, in-kind contributions, and indirect cost supplements as well as other services and funding.

Funding Partners: In addition to the $941,525 in federal funds, these projects reported an additional $656,969 of in-kind contributions from the institutions and school districts as well as external funding from such companies, foundations, federal agencies, and businesses as: Birmingham Botanical Gardens, Engineering is Elementary, McWane Science Center, Trader Joe's, International Paper, Caring Foundation, Lowder Family Foundation; Montgomery Museum of Fine Arts, Alabama Shakespeare Festival, Alabama Technology in Motion, Alabama State Council for the Arts, Southeast Center for Education in the Arts bringing the total funds supporting these projects to $1, 598,494.

PERFORMANCE OUTCOMES. An estimated nine hundred forty-four (944) teachers, one hundred sixty-five (165) administrators, and fourteen (14) para-professionals representing 72 public school districts and 21 private schools participated directly in one or more of the twelve (12) federally-funded projects. An estimated seven hundred (700) of these teachers served 80 public school districts identified by the Alabama State Department of Education as "high need." An estimated 70,000 students were directly impacted by the teaching. Two (2) projects exceeded eighty (80) hours of instruction; twelve (12) projects exceeded forty (40) hours of instruction. All projects had formal professional development averaging ten months of project activity.

PART THREE

HISTORICAL SUMMARIES

HISTORICAL SUMMARIES

LEGISLATION/CONTINUATION AWARDS FY 2016-2017.: On December 10, 2015 the "Every Student Succeeds Act" (ESSA) was signed into law to replace "No Child Left Behind" (NCLB). ESSA did not provide continuing appropriations to state agencies of higher education (SAHEs). However, the U. S. Department of Education provided a year of transition for these grants under the former NCLB rules with a 2016-2017 fiscal year allocation to the Commission on Higher Education of $879,659.[8]

HISTORICAL SUMMARIES: The focus of this section of the report are historical summaries of eight (8) projects continuously funded from the year of their first grants through FY 2016-2017.[9] Except for the AMSTI Historical Summary which was compiled by Dr. Richard Littleton (Independent Professional Evaluator) the summaries were prepared by each of the Project Directors identified below.

NATIONAL AND INTERNATIONAL RECOGNITION. The significance of these projects cannot be overestimated. As Project Directors participated in national and international conferences they shared their NCLB activities in conference presentations, published their work in professional journals, and were the recipients of awards for their achievements. In one instance, the work attracted major funding from the National Science Foundation.

In addition, teachers participating in the independent study program (STAR) were provided an opportunity to travel nationally and internationally to expand the depth of their knowledge in respective content areas. A number of these teachers were recipients of prestigious national awards that recognized the importance of the work they were engaged in. Others were able to attract additional funding through grants that enabled them to expand on the work.

The USDE 2016-2017 fiscal year allocation was distributed to eight (8) projects in the form of continuation awards.[10] National and international recognition for these projects follow.

[8] ACHE awarded $895,962 of federal funds (NCLB) for projects in award grants to continue FY2015-2016 projects. Eight (8) grants were awarded to six (6) Alabama public universities, including one university collaborating with the ALSDE on the Alabama Math, Science, Technology Initiative (AMSTI). Category A: $219,437 for Alabama Math Science Technology Initiative (AMSTI) (1 project); Category B: $676,525 for Continuation of FY 2015-2016 Master of Content Projects (7 projects)

[9] Detailed historical records of each of these projects submitted by the current directors are on file for each project. These records contain names of project leaders, administrators, and presenters along with numbers of teachers and school districts served, ACHE NCLB grants awarded each year, supplementary funding, and other details.

[10] No competitive grant review was conducted since projects awarded FY2015-2016 grants were continued from the previous year (FY2016-2017)

ALAHASP: Alabama Hands-On Activity Science Program

University of Alabama at Birmingham

Project Director: Dr. J. Michael Wyss

Co-Directors: Ms. Katie Busch; Ms. Kay Garcia; Ms. Joan Dawson; Ms. Beverly Radford

National Recognition:

Project staff presentations in national conferences/journals:

National Science Teacher Association, 2016.

American Society for Engineering Education, 2016.

NIH Science Education Partnership Award Meeting, 2016.

The Private Eye® national certification for two project leaders and two presenters, 2009.

AMSTI: Alabama Math-Science-Technology Initiative[11]

Project Directors: Ms. Shelly Hollis (UNA); Dr. Debra Baird and Ms. Carrie Lin (ATSU); Dr. William Carr, Dr. Jordan Barkley, Dr. Kelly Ryan, and Dr. Eric Lee (JSU); Dr. James Miller (UAH); Ms. Mary Lou Ewald (AU); Mr. Clarence Pettway (WCC-Selma); Ms. Kimberly Dove and Ms. Sherrie Blackmon (TU); Dr. André Green (USA) 2016-2017

Historian/Independent Professional Evaluator: Dr. Richard Littleton

National Recognition:

Math-Science Partnership Award, Washington DC, 2014.

National Council of Teachers of Mathematics (NCTM), Boston. Project staff presentation, 2015.

Comprehensive Arts Education/and Alabama Institute for Education in the Arts (AIEA)

University of South Alabama

Directors: Dr. Jeanette Fresne; Ms. Martha Lockett; Ms. Linda Dean

Co-Director: Dr. Paige Vitulli

National Recognition:

Project staff presentations/publications in national conferences/journals:

Mountain Lake Colloquium, Virginia, 2006, 2011.

Arts Education Partnership, Pennsylvania and California, 2008.

International Conference Society for Information Technology and Teacher Education, Louisiana, 2013.

Advocate: A Journal for Education of and Advocacy for Young Children, 2013.

International Journal of Pedagogies and Learning, 2013.

Association for the Advancement of Computing in Education, 2013.

Journal of the Florida Association for the Education of Young Children, 2015.

Journal of the Texas Association for the Education of Young Children, 2015.

Academic Seminars for the School of Education, Shaoxing University, China, 2015.

[11] For purposes of the award granted in FY 2017-2017, the multiple AMSTI projects were consolidated into a single project (University of South Alabama).

Journal of the Early Childhood Music & Movement, Association, 2016.
Seminole County School System, Georgia, 2016.

IMPACTSEED: Improving Physics and Chemistry Teaching in Secondary Education
Jacksonville State University
Project Director: Dr. Nouredine Zetilli
National and International Recognition:

Cyprus - Eastern Mediterranean University Press. International refereed project director's presentation: Frontiers in Science Education Research Conference, 2009.
Project staff presentations/publications in 20 international, national, and in-state physics professional conferences and journals, 2004-2016.

Physical Science in the 21st Century: Improving Teacher Quality and Mastery of Content (PS-21)
The University of Alabama
Project Director: Dr. Dennis Sunal
National Recognition: *Leveraged funding resulting from ACHE NCLB award:*

American Association of Physics Teachers, $299,998, 2011.
"Alliance for Physics Excellence (APEX)," National Science Foundation Mathematics and Science Partnership, $1,600,000, 2012.
"Robert NOYCE Teacher Scholarship Program in Physics, Chemistry, and Mathematics," Track 1, National Science Foundation, $1,450,000, 2013.
"Robert NOYCE Track 2 Fellowship Program in Physics, Chemistry, and Mathematics," National Science Foundation, $1,499,000 + $450,000 cost share, 2016.

The University-School Partnership for Secondary Science (BioTeach)
University of Alabama at Birmingham
Project Director: Dr. J. Michael Wyss
National Recognition: *Publication*
American Physiological Society, *Sourcebook of Laboratory Activities in Physiology*, 40: 110-115, 2016: "Sickle cell anemia: tracking down a mutation": an interactive learning laboratory that communicates basic principles of genetics and cellular biology.

STAR (Success Through Academic Research) Project: An Independent Study Scholarship Program

University of Alabama in Huntsville

Project Directors: Dr. John Pottenger; Dr. Andrea Word

National Recognition: *Sample awards and recognition for STAR participating teachers, 2002-2017:*

National Endowment for the Humanities (NEH):

Landmarks of American History Workshop Grants (3).

"We the People" Workshop ant Text Grants.

NEH Scholarship for Teaching Alabama History.

Ruth Halvorsen Fund and National Art Education Foundation Grant (Guatemala).

Mississippi-Alabama Gulfport Consortium Grant: Weightless Flights of Discovery.

Woodrow Wilson Research Fellowship (Costa Rica).

Hendrix Scholarship: National Orff Conference.

National School Public Relations Association Award.

Toyota International Teaching Program (Japan).

National Geographic Society Education Foundation Grant.

NASDAQ National Teaching Award.

Wiregrass Math, Science, and Technology Leadership Academy

Troy University-Dothan

Project Directors: *Dr. Vijaya Gompa; Dr. Shawn Plash (2016-2017)*

ALAHASP:

ALABAMA HANDS-ON ACTIVITY SCIENCE PROGRAM

University of Alabama at Birmingham

Project Summary (1994 – 2017)

Dr. Mike Wyss, Project Director
Katie Busch / Kay Garcia, Co-Directors
Joan Dawson, Co-Founder, Retired Director
Beverly Radford, Retired Director

Since 1994, ALAHASP has logged over 16,000 *participations* by teachers and administrators in 49 Alabama school systems and 38 private and faith-based schools. We have planned, conducted, and/or facilitated over 1,300 science events and served as a catalyst for school systems, corporations, and community partners to spend $9,587,314 to support science education reform in K-8 classrooms. The number of students who have had a teacher influenced by ALAHASP professional development since 1994 is beyond counting and beyond knowing. Some of those students are probably teaching science now!

In the **1993-94** academic year, Dr. Steven Underwood, Dr. Gary Sapp, and Joan Dawson founded ALAHASP at the UAB School of Education. The late Dr. John Wright, renowned visionary and creator of the Hands-On Activity Science Program (HASP) from the University of Alabama in Huntsville (UAH) and HASP Co-Director Arlene Childers Elrod introduced the research-based science program to UAB and ALAHASP's co-founders guided the program's development in numerous school systems throughout Alabama.

In the **1994-95** academic year, ALAHASP conducted its first module workshops for grades 2-5 with two modules per grade level with the help of UAH HASP trainers. These first participants included 58 teachers and 8 administrators from 6 Birmingham area school systems, with 50 additional teachers from 6 school districts: Bessemer, Birmingham, Hoover, JefCoEd, Mountain Brook, Vestavia Hills. Joan Dawson conducted follow-up sessions and visited participant classrooms. An additional grant for $10,000 from the Stockham Foundation helped fund the project.

In **1995-96** ALAHASP continued with a goal to initiate modules for grades 3-4 in all 100 schools in the 6 consortium systems and to expand modules for teachers previously trained (grades 2-5). Dr. Underwood and Joan Dawson joined the Technical Assistance Academy for Mathematics and Sciences Services (TAAMSS) with the Eisenhower Consortium at the Southeastern Regional Vision for Education (SERVE), which was a 5-year commitment. The SERVE program began funding Cooperative Learning workshops with Dee Dishon.

In **1996-97** the goal was to initiate ALAHASP in grades 3 and 4 in the Auburn region and continue training grades 2-5 in the Birmingham region. The led to establishing an Auburn Hub run by Dr. Michael Kamen, Glenda Bush, and Vicki Miller of the East Alabama Regional In-service Center (EARIC). In- services centers like EARIC were critical in the early days of ALAHASP when there was not funding to pay for substitute teachers—RICs were willing and able to support teacher professional development by paying for subs or other costs. ALAHASP staff continued to conduct follow-up workshops on top of initial trainings and made classroom visits.

With the great enthusiasm and success demonstrated, ALAHASP continued to grow in **1997-98** with a goal to initiate ALAHASP in grades 4-5 with the University of South Alabama in Mobile County Schools, as well as to expand in grades 2-5 in Auburn and Birmingham regions. To help accomplish this the program directors applied for and received additional funding from the Stockham Foundation and the State Department of Education. This enabled another hub and materials center to be established in Mobile. Sheila Mosley, Dr. Eddie Shaw, Carla Pryor, Mary Michael Campbell, and Dr. Phil Feldman ran this Mobile branch. The SERVE partnership led to a SERVE summer institute for Chilton County teachers and administrators.

In **1998-99** ALAHASP worked to bring module training to 1st to 5th grade teachers in Cherokee County (1st excluded), Hale County (grades 2-4 only), Cornerstone School (BHM) and Memorial Park School (Jasper). The project directors also expanded ALAHASP in grades 4-5 in Mobile County and grades K-5 in the UAB and AU regions. The program saw continued funding and support from the State Department of Education and Community Foundation of South Alabama. Elmore County began developing teacher leaders who could assist with training facilitation.

The **1999-2000** academic year was an especially important year for the project because the invaluable Beverly Radford joined the team (and continues to serve on the project today) as well as 12 NSF GK-12 fellows. With the dynamic additions to the team, the project took on ambitious goals to introduce ALAHASP in Chambers County, Jackson County, Montgomery County, and Perry County for grades K-6 (not all grades in all counties). It also expanded in grades 4-5 in Mobile County, grades1-5 in Cornerstone and Memorial Park and conducted follow-up in grades 2-5 in Cherokee County and 2-4 in Hale County. The teacher-leader-development initiative expanded to Jackson County and Birmingham region. In 1998 ALAHASP's directors worked with other leaders across the state to develop AL LASER: the Alabama Leadership and Assistance for Science Education Reform. This model consisted of a 6-day institute in which school leaders would developed 5-year strategic implementation plans. AL LASER's officers were Dr. Lee Meadows, Dr. Joe Burns, Beverly Radford, and Brenda Terry. In 1999 ALAHASP began implementing LASER program in Clanton and Birmingham.

In **2000-01** ALAHASP sought to conduct its module trainings in Attalla, Montgomery, Selma, and Tuscaloosa City as well as teacher leadership development in Mobile and Jackson Counties and continue AL LASER trainings. AL LASER institutes were held for Alabama School for the Deaf (ASD), Auburn City,

Catholic Diocese of Birmingham City, Dothan City, Eufaula City, Lowndes County, Mobile County, Selma City, St. Clair County, Sumter County, Talladega County, and Tuscaloosa City. Additional support for AL LASER came from Alabama Power, Bell South, Gulf Coast Explorium, Michelin North America, and SERVE. Beverly Radford began the same 5-year TAAMSS SERVE professional development program that Mrs. Dawson and Dr. Underwood began in 1996.

In **2001-02** ALAHASP received its first American Honda Grant to help achieve to goals of: 1) introduce ALAHASP to Alabama School for the Deaf, Andalusia City, St. Clair County, and Talladega County; 2) expand the program in Attalla City, Birmingham City, Hale County, Jackson County, Jasper City, Mobile County, Montgomery City/County, Perry County, and Selma City; 3) continue leadership development for Grades 2 - 6 in Mobile County and K - 6 in Jackson County; 4) support consultation services in the Auburn University and University of South Alabama regions.

In the **2002-03** academic year the State Department created AMSTI to increase the number of teachers trained in module kits. At that time, AMSTI was based out of UAH and therefore targeted the Northern region of the state. Therefore, ALAHASP's goals were to introduce ALAHASP to Limestone and Lowndes County and the Catholic Diocese of Birmingham, support preservice education at AU, UAB, USA; expand program at ASD, Andalusia, Hale, Jasper, Mobile, Montgomery, Perry, Selma, Talladega, and UAB region, and establish ALAHASP Leadership Institute. In this year, 45 teachers who were trained in the ALAHASP teacher leadership programs lead 70 hands-on science curriculum workshops. ALAHASP continued to present AL LASER institutes for many systems and hosted our first The Private Eye ® workshop. For this inaugural session the creators of The Private Eye ®, Kerry Reuf and David Melody, traveled to Birmingham and crated a special Alabama-centered curriculum.

2003-04 marked the 10th anniversary of ALAHASP! The goals continued to focus on introducing ALAHASP to the school systems of the previous grant or continue training in systems that had had training in previous years. As K-5 teachers often change grade levels, as well as schools it was important to remember and return to previous participants. ALAHASP also continued to conduct leadership institutes for teacher leaders, assist with 5-year strategic planning, and work with NSF fellows. In this year ALAHASP received its third American Honda Grant and Kerry Reuf and David Melody returned for another Private Eye workshop.

By **2004-05,** 26 school systems had participated in AL LASTER, AMSTI had expanded to three new sites, and 45 teacher leaders were actively presenting hands-on module workshops. ALAHASP continued module and leadership trainings in Gadsden, ASD, Andalusia, Bessemer, Birmingham Catholic Diocese, Fairfield, Hope Academy (Presbyterian Home for Children), Jasper, Limestone County. Lowndes County. Mobile County. Montgomery Public Schools, Selma, Spring Valley School, Talladega County, UAB Region, and preservice education at UAB and USA. Private Eye workshops continued to show teachers how to develop investigations and teach science across the curriculum and ALAHASP's outstanding style was gaining

reputation across state lines—Beverly Radford, Joan Dawson, and Brenda Terry were asked to lend their expertise to Florida teachers for a math and science inquiry workshop.

In **2005-06** ALAHASP continued its involvement in AL LASER, SERVE, AMSTI, and AMSTEC. The Private Eye continued to be led by Kerry Reuf and David Melody with special sessions for science leaders, school leaders, and teachers of gifted students. ALAHASP continued to serve teachers in previous locations through module workshops (many conducted by teacher leaders) and leadership institutes.

In **2006-07** ALAHASP added Leeds City and Escambia County to its list of partner systems. The Private Eye trainings continued to grow with five 2-day sessions offered with support from the Alabama Power Foundation. ALAHASP expanded its partnership with UAB to work with the SciTech Honors program and bring STEM majors to work with Birmingham City elementary students. This was also an important year because it was the beginning of the Central Alabama Science Education Exchange (CASEE)—a forum of curriculum and science administrators for area school systems. This program connected area administrators with each other and ALAHASP experts to discuss science education and curriculum. It has thrived and grown for the past 10 years. In the 06-07 academic year ALAHASP conducted 34 hands-on science module workshops, 5 TPE 2-day workshop, 5-day National LASER Middle School Science Ed Planning Symposium (SPI), CASEE meetings, 77 activities (visits and planning) between UAB SciTech students, ALAHASP staff, and Birmingham classroom teachers.

In **2007-08** ALAHASP provided ongoing support to schools in Birmingham City, Catholic Diocese of Birmingham, Gadsden City, Hope Academy, Jefferson County, Leeds City, Limestone County, Spring Valley, St. Clair County, Talladega County, Trussville City, Turtle Point in Escambia County, and UAB Region. As well as assisting school system partners with long-range planning for ongoing professional development for teachers. Private Eye, CASEE, and SciTech partnerships continued and new partnerships were formed with the Birmingham Botanical Gardens, McWane Science Center, and the Alabama Power Foundation to support workshop and meeting locations and facilitation. Ms. Dawson and Ms. Radford conducted inquiry workshops for Lowndes County “Mega-Professional Development Institute.”

The goals in **2008-09** remained similar to those in the previous year with an added focus on supporting private schools that serve students with special needs and developing a formal Leadership Academy to address the professional development needs of teachers and administrators in deepening their understanding of inquiry teaching, science content, literacy connections, and the process of change. To meet the leadership goal, the inaugural ALAHASP Academy (modeled on SERVE and TAMSS) began with17 science and mathematics peer leaders from AMSTI-UAB schools, 5 AMSTI-UAB staff, 9 non- AMSTI peer leaders. It was a two-day workshop with a third day of follow up later in the year. Kerry Reuf and David Melody returned to conduct The Private Eye workshops for the 6th consecutive year and certified Joan and Beverly as well as two teacher leaders, Ann Bettis and Janelle Adams, to be Private Eye Trainers. The AMSTI program was well established and ALAHASP became an AMSTI Affiliate.

With the growth of AMSTI the goals for **2009-10** were slightly refined to read: continue to provide professional development in K-8 basic science modules for teachers in non-AMSTI schools, including those in private schools; continue to provide assistance to teachers in implementation of science modules in K-5 classrooms by utilizing students in the UAB Science and Technology Honors Program for the purpose of assisting with science content knowledge, small groups of students, and materials associated with doing science; continue to provide advanced professional development in science education for teachers after they have completed basic science module training; and continue to provide guidance and professional development for school system administrators. ALAHASP trainers conducted 11 workshops, the initial Academy met for two additional days of training and a new academy launched in Selma.

2010-11 Marked an important year for ALAHASP—with the growth and success of AMSTI it was decided that in 2011 ALAHASP could hand over all module kit-based training over to AMSTI. ALAHASP continued to conduct module trainings and follow-ups for this year but began to develop a six-session model for the Academies and the directors began to dream of how to grow their program and take it to a new level. The Selma academy continued and a new academy began in Chilton County. CASEE meetings continued to meet every other month to support curriculum administrators and the SciTech program thrived with the creation of UAB's U-STARS program.

In the **2011-12** academic year ALAHASP conducted its last module workshops and follow-ups and handed over all module workshops to AMSTI. However, there was still a great need for ALAHASP for non-AMSTI teachers—for hundreds of teachers ALAHASP was their only source of science professional development. Trish Herminghaus worked with ALAHASP to train 60 teachers in scientific notebooking and ALAHASP Academies expanded to 5 locations—Selma, Chilton County, Hoover, Gadsden, Birmingham with an additional mini group in Leeds.

2012-13 was a big transition year for ALAHASP. The program moved from UAB's School of Education to the College of Arts of Sciences and gained a new P.I. Dr, Mike Wyss of UAB's Center for Community Outreach Development (CORD). Katie Busch, also of CORD joined the team as an "intern- director". ALAHASP continued to conduct and develop academies with Chilton County, Selma, Hoover, and Gadsden, presented notebooking workshops, brought SciTech students to Birmingham classrooms, and created a technology workshop with teacher leader Karen Darroch. CASEE and Private Eye also continued as successful and anticipated programs.

In **2013-14** Katie Busch, Ed. S. officially joined the team and Mrs. Dawson and Radford turned administrative duties over to Ms. Busch and Kay Garcia while remaining on the team to conduct workshops and advise planning. ALAHASP continued to offer The Private Eye, Notebooking, and Inquiry workshops as well as CASEE meetings. Ms. Busch attended a three-day Engineering is Elementary® (EiE) academy in the Museum of Science Boston and became a certified trainer. She promptly turned this training around and presented a 1-day EiE workshop to the Gadsden academy. All former academies were completed and two new academies were added in the Birmingham area.

In **2014-15** ALAHASP continued to work under the same goals with the addition of Engineering is Elementary workshops added to the repertoire of The Private Eye, Scientific Notebooking, and Inquiry-based science. ALAHASP added two new school systems—Blount County and Alabaster City—to the list of teachers served and began a partnership with the N.E. Miles Jewish Day School. The Gadsden Public Library and Gadsden City Schools worked in partnership with ALAHASP to develop a Technology in the Science Classroom workshop. The library was an instrumental partner because they could provide technology to students or teachers who do not have normal access to devices or internet.

In **2015-16** Alabama adopted new science standards based on the Next Generation Science Standards. This marked one of the biggest shifts in ALAHASP's history as the program directors decided to create and conduct grade-level specific science content workshops *without* kit-based modules. This included Engineering is Elementary workshops, Science and Inquiry, and The Private Eye, as well as the development of a pilot 2nd grade science workshop. The second grade workshop was highly-successful with many teachers reporting implementing what they learned the following day in their classrooms and a 4th grade workshop was developed and presented in the same year. These workshops were developed in partnership with teacher consultants from the grade level specified. ALAHASP also began a partnership with Macon County Schools and conducted a Private Eye session with Tuskegee Public Schools. The partnership dissolved due to the schools involved receiving materials, funding, and mandatory training from Apple ®. CASEE meetings grew so popular and successful there were over 50 individual participants throughout the year. Based on the increasing number of informal science educators attending, ALAHASP created a similar group, STREAM-X, from the same model as CASEE. The goal was to improve offerings of science education programs offered by these institutions to better match the standards and meet the needs of classroom teachers, as well as to provide professional development for teachers to learn the content presented in the programs.

2016-17 marked the first implementation year of the new Alabama Science Standards. ALAHASP implemented three new grade-level-specific science and engineering workshops including Kindergarten, 3rd, and 5th grade. ALAHASP also began a new partnership with Dale County to begin work in the Wiregrass region and has conducted secondary science workshops so far with plans for elementary science in the future. In 2016 many teachers trained in the The Private Eye asked to return to a day-1 session. This prompted ALAHASP to create a third day of Private Eye to serve as both a master class and "refresher". Kerry Reuf and David Melody asked for a write-up of the session and are interested in including it in their repertoire. In January ALAHASP collaborated with Camp McDowell to develop a program (funded by the Kaul Foundation) to train K-12 teachers in inquiry-based science education with a focus on field research.

If we were to put it simply, ALAHASP is the story of what a handful of passionate, dedicated people can do when there is support from their community and funding. This project, born in a Northern corner of the state, spread all the way to the coast, changed attitudes and opinions about science education, and helped give birth to a vital STEM program (AMSTI). This project has been able to grow and adapt to serve teachers'

needs as time, technology, and standards change. Year after year, we have received two common responses after ALAHASP workshops from participants:

"This was one of the best PD's I've ever been to!" and "I'm leaving feeling more confident, inspired, and knowledgeable about my science content!"

There have been many directors, administrators, teachers, participants, students, and funding agencies involved in the success of ALAHASP, but none of it would have been possible without ACHE. For ACHE's continued support, you have the gratitude of every student and educator directly or indirectly connected to this project who has felt the joy of discovery and the wonder of science in the past twenty-three years. Thank you.

Alabama Math – Science – Technology Initiative (AMSTI)

Professional Learning Teams Project/

Lead Teacher Enhancement Project

Athens State University
Auburn University
Jacksonville State University
Troy University
University of Alabama in Huntsville
University of North Alabama
University of South Alabama
Wallace Community College - Selma / Alabama State University
in collaboration with
Alabama State Department of Education

Project Summary (2008 – 2017)

AMSTI Professional Learning Teams Project was proposed by the University of North Alabama (UNA) and funded by the program in fiscal year 2008-2009. The primary objective of the project was to organize, conduct, and sustain job imbedded professional learning teams (PLTs) in participating Alabama Math, Science, and Technology Initiative (AMSTI) schools. A secondary objective was to expand leadership at the school level by empowering lead teachers with the knowledge and resources needed to provide content deepening professional development (PD) in math and science through PLTs focused on student achievement. All eleven AMSTI sites participated in the project. Lead teachers and administrators from AMSTI schools participated in professional development (PD) to organize, conduct, and maintain PLTs. PLTs were grounded in best practice and focused on student engagement. Content deepening in math and science was determined by needs assessment with support from AMSTI specialists. The project provided release time for PLTs meetings as well as resources needed for PD. While the project was only partially successful in reaching proposed objectives, it provided the foundation for projects funded by the program over the next seven years.

The project was refined in fiscal year 2009-2010 with the piloting of a model that built off the previous project and was transportable to all AMSTI sites in the state. The project was titled the *AMSTI Lead Teacher Enhancement Project* and led by Jacksonville State University. The project included AMSTI sites at Jacksonville State University (JSU), Athens State University (Athens), and The University of South Alabama (USA). The project contained overarching objectives of instructional reform (professional learning teams) and curriculum reform (content deepening aligned with standards) with a focus on high needs schools. New schools entering the project were designated as Phase 1 schools. Lead teachers and administrators from

Phase 1 schools received PD and support in establishing, maintaining, and sustaining PLTs. Phase 1 teams left the training with a written plan for implementing PLTs in their schools.

AMSTI schools that had completed PLT training and had initiated PLTs in their schools were provided data driven content deepening in math and science grounded in best practice and focused on student achievement (Phase 2). The project was shown to reach objectives through analysis of data from site visits, teacher content knowledge measures, and PD post reflective surveys. Assessment of teacher pedogeological content knowledge and student achievement proved to be challenging during year two and would remain elusive throughout the life of the program. The model was refined further and continued through fiscal year 2010-2011 with AMSTI-JSU, AMSTI-Athens, and AMSTI-USA participating.

In fiscal year 2011-2012, JSU and Athens submitted successful proposals. These projects were unique to the needs of the individual sites while following essentially the same model as previous years. In fiscal year 2012-2013, the model was extended to The University of Alabama in Huntsville (UAH). In subsequent years, (2013-2014, 2014-2015, 2015-2016) the program added project proposals from AMSTI sites at Wallace State Community College Selma/Alabama State University (AMSTI-WCCS-ASU), Auburn University (AMSTI-AU), and Troy University (AMSTI-Troy). Hundreds of teachers and thus thousands of students were positively affected by the projects through partnerships with the Alabama State Department of Education (ALSDE), Alabama Regional In-Service Centers, and local education agencies (LEAs) throughout Alabama.

INTRODUCTION AND BACKGROUND

The Alabama State Legislature created eleven regional in-service centers in 1984. These centers were partnered with institutes of higher education (IHE) and ALSDE to serve the professional development needs of K-12 public school teachers in the state (https://www.alsde.edu/).

AMSTI was initiated by ALSDE beginning in 1999 to improve math and science teaching statewide. Each AMSTI site was associated with one of the eleven Alabama regional In-Service Education Centers. Each AMSTI site was unique with varying ties to the partner university and to the corresponding in-service center. AMSTI sites at UNA, JSU, Athens, UAH, WCCS-ASU, AU, and Troy submitted successful proposals from 2008 until 2016.

The following narratives present a summary of each project site relative to *AMSTI Professional Learning Teams Project/ AMSTI Lead Teacher Enhancement Project* during the eight years of the program. Each is presented as a stand-alone narrative followed by appendices presenting data specific to the site.

THE UNIVERSITY OF NORTH ALABAMA

AMSTI Professional Learning Teams Project

Shelly Hollis, Project Director

Year One: Fiscal Year 2008-2009

All 11 AMSTI sites were invited to participate in the project during Year One (Y1). The title of the project was: *AMSTI Professional Learning Teams* and was led by the regional AMSTI site at the University of North Alabama. The project was designed to provide professional development (PD) for selected lead teachers and administrators in all eleven regional AMSTI sites to promote establishment of Professional Learning Teams (PLTs) in participating schools. The project provided PD based on best practice espoused in the seminal work by Anne Jolly (Jolly, 2007) for establishing, conducting, and sustaining PLTs. Training included many lead teachers and AMSTI specialists across the state. This initial training would become important to the project in coming years as a foundation for PLTs.

A second objective was to expand leadership at the school level by empowering teams of lead teachers with the knowledge and resources needed to provide content deepening professional development (PD) in math and science through PLTs focused on student achievement. The project provided release time for PLTs during the school year.

In theory, the concept seemed straight forward. Content deepening provided training for lead teachers in best practice. These lead teachers then returned to their schools and shared what they learned with colleagues through the mechanism of PLTs. In practice, sharing new knowledge through PLTs at 11 sites proved problematic. This train the trainer model was a foundation block of AMSTI and remains the fundamental mode of capacity building for the initiative.

Although the project showed promise in meeting objectives, management of all 11 sites by one IHE proved challenging. Recommendations were made by the external evaluator including a more focused approach to implementing the project.

JACKSONVILLE STATE UNIVERSITY

AMSTI Lead Teacher Enhancement Project

Dr. William Carr / Dr. Jordan Barkley / Dr. Kelly Ryan, Dr. Eric Lee, Project Directors
Tanya Barnes / Kay Johnson, Project Administrators

Year Two: Fiscal Year 2009-2010

AMSTI-JSU was selected as the lead site in year two (Y2) of the project. The objective during Y2 was to determine the feasibility of implementing a pilot in a limited number of AMSTI sites. Additionally, the model would need to be sustainable over time, and exportable to all AMSTI schools within all AMSTI regions, including high need schools. The model was piloted in three AMSTI sites: JSU; Athens State University (Athens); and The University of South Alabama (USA). The model included PD for a selected cadre of lead teachers and administrators from each participating school in the implementation of PLTs (phase one) and content deepening PD for lead teachers, administrators, and classroom teachers from the participating AMSTI sites (phase two).

PD utilizing the work of Ann Jolly (Jolly, 2008) was conducted for lead teams from selected schools in the three regional AMSTI sites. Teams included both teachers and administrators. Lead teams returned to schools with a written plan and resources necessary for creating PLTs that addressed unique needs within each school. With support from AMSTI specialists, PLTs were established in a manageable number of school. The project provided funding for substitute teachers so that team members could meet regularly four full days or eight half days during school hours.

Content deepening PD during Y2 focused on improving math and science instruction aligned with state standards. Following a needs assessment, content deepening sessions were conducted primarily during the summer and supported by AMSTI specialists through contact hours during the school year. AMSTI specialists trained in instructional best practice worked closely with project teachers through mentoring, co-teaching, and modeling. Many teachers would return to summer sessions during the coming years of the project. The sessions became popular with rooms often at capacity. The project did not provide stipends for participation but did provide training materials and resources including presenters.

Activities during Y2 included: 1. Selection of qualifying schools based on specific criteria including high needs and low performing schools; 2. Implementation of a proved strategy of establishing, conducting, and sustaining PLTs in Phase One Schools (Instructional Reform); 3. Implementation of Content Deepening in Phase Two Schools (Curriculum Reform).

Findings by the external evaluator indicated the project was successful in reaching the goals and objectives expressed in the proposal. Sustainability of PLTs in many schools without support from the project would remain a challenge throughout the life of the project.

Year Three: Fiscal Year 2010-2011

The objective during year three (Y3) was to expand the PD model for instructional reform (Phase One Schools) and curriculum reform (Phase Two Schools) piloted during Y2 within the AMSTI regional centers at JSU, Athens, and USA. JSU served as the lead site, coordinating a maze of logistics relative to the project through all three sites. Additional schools were added to the project as Phase One Schools and content deepening was provided in mathematics and science for Phase Two Schools. Prerequisites for selection of a school to participate in the project included the school must have been an ALSDE approved AMSTI school, mathematics and science faculty must have participated in ALSDE AMSTI summer institute training, the school's administrator must have committed to conducting regularly scheduled meetings of PLTs in the school during the school day, and the school administrator must have committed to meeting monthly with the AMSTI site director. Strong association of participating schools with AMSTI assured active support of AMSTI specialists to strengthen the content deepening PD. Active participation of administrators in the project was important to sustaining the momentum achieved during Y2.

Evaluation of the project consisted of teacher content knowledge measures, surveys, site visits, and analysis of artifacts relative to project activities. Findings by the external evaluator included meeting the objectives of the project, adherence to state and national standards for PD, increases in teacher content knowledge, and increases in teacher self-efficacy using the new knowledge in their instructional practice. Recommendations included continuing to expand the project to other schools within the three regional sites.

Year Four: Fiscal Year 2011-2012

AMSTI-JSU along with other AMSTI sites submitted a successful proposal for year four (Y4) that would extend the model developed during the previous two years. Objectives during Y4 included expanding the model to other pk-12 schools in the AMSTI-JSU region and providing content deepening PD aligned with state standards.

A data driven approach to needs assessment focused efforts of PLTs established during previous years of the project. Math and science PD grounded in research on best practice was provided. Math content deepening utilized research from the Ongoing Assessment Project (OGAP). While many teachers had experienced OGAP in previous years, there were still many teachers that requested OGAP to help them connect their instructional practice to state adopted standards for mathematics. ALSDE certified AMSTI specialists, trained in presenting OGAP, facilitated several PD sessions in Additive Reasoning and Multiplicative Reasoning. Many teachers would return during Y4 and in later years to sessions from OGAP including Fractional Reasoning and Proportional Reasoning. This vertical approach to content deepening and alignment of PLTs was widely accepted by teachers and administrators seeking to strengthen their understanding of content standards in grades above and below the level in which they served. Science

content deepening sought to provide alignment of curriculum with standards. Largely targeted to k-8 teachers, science PD sessions focused on the physical sciences. The project supported PD through resources and materials utilized during the training and release time for PLT members throughout the school year.

Findings by the external evaluator included increased teacher content knowledge, improved teacher efficacy in teaching the content, and improved confidence in sharing the new knowledge with colleagues. Additionally, the PD demonstrated adherence to state standards for PD. Recommendations from Y4 included expanding the project to include secondary teachers, especially middle school teachers.

Year Five: Fiscal Year 2012-2013

Year five (Y5) was a continuation of previous efforts to strengthen the project. Additional schools were added and PD was provided based on data driven needs assessment. OGAP was expanded during Y5 and training in robotics was leveraged from other grants that delivered quality science and engineering PD to middle and high school teachers. Teachers returned to OGAP sessions that strengthened their content knowledge in math.

Findings by the external evaluator were along the line of those from the previous year. Utilizing site visits, teacher content knowledge measures, efficacy surveys, and artifacts, a large body of evidence suggested that the project was successful in meeting the goals of curriculum and instructional reform. Findings included increases in teacher content knowledge, efficacy, and confidence in sharing the new knowledge. PLTs continued to provide collegial sharing of new knowledge. Still missing was evidence of increases in teacher pedogeological content knowledge and student achievement. Those would remain a challenge to document through the next two years.

Year Six: Fiscal Year 2013-2014

More schools were added and content deepening in math and science continued during year six (Y6). Evaluation efforts built on previous years and findings continued to strengthen the conclusion that the project was reaching the intended goals of instructional and curricular reform.

Recommendations from the external evaluation of Y6 included providing additional support that reinforced Phase I training, developing a model for future growth and sustainability of the project over time, increasing efforts to include teachers from secondary grades (7-12) in the project, continuing to leverage resources including industry partners and PD opportunities, and developing a process to monitor schools exiting the project to explore long term impacts on instructional reform and curricular reform.

Year Seven: Fiscal Year 2014-2015

The project was successful in extending the model of instructional and curricular reform during year seven (Y7). Schools meeting project requirements were identified. Lead teachers and administrators from qualifying schools participated in Phase I activities intended to reform instruction through PLTs. Teachers

from the AMSTI-JSU service area participated in content deepening PD intended to enhance instruction and deepen understanding in standards based curriculum.

Survey data from Phase II PD indicated participant satisfaction with the content deepening sessions. Respondents reported that the sessions presented information that they could use in their class, presented information new to them, included strategies appropriate to the grade level that they taught, was well organized and presented, and involved fundamental concepts of the subject.

Findings relative to improvements in teacher content knowledge during Y7 were inconclusive. There was not a statistically significant difference in teacher content knowledge as measured. Challenges with choosing an appropriate measure, administering the measure, and interpreting data relative to PD topics may not have reflected the impact of the project on teacher content knowledge during Y7.

Recommendations by the external evaluator were along the same lines as previous years. The missing pieces of quantifiable data seemed to be teacher pedagogical content knowledge and student achievement. Sustainability of the model following cessation of support from the project was also seen as important. Data reporting during the seven years JSU participated in the program demonstrated outreach to hundreds of schools across the state. Teacher and administrator collaboration through PLTs and content deepening activities were important to instructional and curriculum reform in participating schools.

ATHENS STATE UNIVERSITY

AMSTI Lead Teacher Enhancement Project

Dr. Debra Baird / Joyce Waid / Carrie Lin, Project Directors

Year Four: Fiscal Year 2011-2012

AMSTI-Athens along with other AMSTI sites submitted a successful proposal for year four (Y4). The project built off prior efforts including *AMSTI Professional Learning Teams* in Year one led by the regional AMSTI site at the University of North Alabama and *AMSTI Lead Teacher Enhancement Project* in Years two and three led by AMSTI JSU. Objectives during Y4 included expanding the model to other pk-12 schools in the AMSTI-Athens region and providing content deepening PD aligned with state standards.

Activities during Y4 included selection of participants based on criteria stated in the proposal, lead teacher and administrator training in PLTs using the model from prior years (Phase 1) and content deepening in science and math (Phase 2). AMSTI specialists took part in PD as presenters and supported teachers at the building level through modeling, co-teaching, and mentoring.

Findings by the external evaluator included increased teacher content knowledge, improved teacher efficacy in teaching the content, and improved confidence in sharing the new knowledge with colleagues. Additionally, the PD demonstrated adherence to state standards for PD. Recommendations from Y4 included expanding the project to include secondary teachers, especially middle school teachers.

Year Five: Fiscal Year 2012-2013

Year five (Y5) was a continuation of previous efforts to strengthen the project. Additional schools were added and PD was provided based on data driven needs assessment. OGAP was expanded during Y5 and training was leveraged from other grants that delivered quality PD to teachers.

One effort that seemed significant was a case study completed by the external evaluator during Y5. The case study consisted of site visits to all PLT meetings, interviews with PLT members, satisfaction and self-efficacy surveys, and a quasi-experimental study comparing student achievement on STAR Math™ of teachers in the school that had experienced OGAP training as compared to students of teachers in the school that had not experienced OGAP training. Findings of the case study indicated a significant difference in scores on STAR Math™ ($t = 5.358$, $df = 382$, $p = 0.000$). A modest effect size ($d = 0.55$) suggested that OGAP training had a moderate practical effect on student achievement in math as measured by the scores on STAR Math™. Additional information relative to the case study was included in the external evaluator's report for Y5.

Additional findings by the external evaluator during Y5 were along the line of those from the previous year. Utilizing site visits, teacher content knowledge measures, efficacy surveys, and artifacts, a

large body of evidence suggested that the project was successful in meeting the goals of curriculum and instructional reform. Findings included increases in teacher content knowledge, efficacy, and confidence in sharing the new knowledge. PLTs continued to provide collegial sharing of new knowledge. Still missing was evidence of increases in teacher pedagogical content knowledge. This would remain a challenge to document through the next three years.

Year Six: Fiscal Year 2013-2014

PLTs continued to be added and content deepening in math and science continued during year six (Y6). Evaluation efforts built on previous years and findings continued to strengthen the conclusion that the project was reaching the intended goals of instructional and curricular reform.

Recommendations from the external evaluation of Y6 included providing additional support that reinforces Phase I training, developing a model for future growth and sustainability of the project over time, increasing efforts to include teachers from secondary grades (7-12) in the project, continuing to leverage resources including industry partners and PD opportunities, and developing a process to monitor schools exiting the project to explore long term impacts on instructional reform and curricular reform.

Year Seven: Fiscal Year 2014-2015

The project was successful in extending the model of instructional and curricular reform during year seven (Y7). Schools meeting project requirements were identified. Lead teachers and administrators from qualifying schools participated in Phase I activities intended to reform instruction through PLTs. Teachers from the AMSTI-Athens service area participated in content deepening PD intended to enhance instruction and deepen understanding in standards based curriculum.

Survey data from Phase II PD indicated participant satisfaction with the content deepening sessions. Respondents reported that the sessions presented information that they could use in their class, presented information new to them, included strategies appropriate to the grade level that they taught, was well organized and presented, and involved fundamental concepts of the subject.

Findings relative to improvements in teacher content knowledge during Y7 were inconclusive. There was not a statistically significant difference in teacher content knowledge as measured. Challenges with choosing an appropriate measure, administering the measure, and interpreting data relative to PD topics may not have reflected the impact of the project on teacher content knowledge during Y7.

Recommendations by the external evaluator were along the same lines as previous years. The missing pieces of quantifiable data seemed to be teacher pedagogical content knowledge and student achievement. Sustainability of the model following cessation of support from the project was also seen as important.

Year Eight: Fiscal Year 2015-2016

During year eight (Y8), the model was extended to create five professional learning communities, composed of lead teachers from different schools and systems within the region, that were focused on a specific goal related to math and science instruction. This allowed AMSTI staff to provide embedded PD to those teachers from multiple schools in a common location and build capacity across the entire region. Invitations were extended to teachers from schools with previous participation in the project first and then expanded to others if space was available. While the approach to selection and training remained essentially the same, the regional method proved to be a more practical in managing the growing number of schools participating in the project and able to benefit a larger number of schools with the decreased funding.

There was not a formal external evaluation during Y8. However, informal feedback from participants and AMSTI specialists suggest the momentum attained during the previous seven years was continued and the goals of curricular reform and instructional reform were achieved. Teachers improved their instructional practice, self-efficacy, and content knowledge.

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

AMSTI Lead Teacher Enhancement Project

Dr. James Miller, Project Director
Carol Mueller / Carolyn Pistorius, Project Administrators

The University of Alabama in Huntsville (UAH) participated in in the ACHE NCLB higher education competitive grant program from Year Five through Year Eight. The project partnered with the Alabama State Department of Education (ALSDE), the Alabama Agricultural and Mechanical University/University of Alabama in Huntsville Regional In-Service Center (AAMU/UAH), and local education agencies (LEAs) throughout northern-central and northeastern Alabama to provide resources and support of professional learning teams as well as content deepening in pk-12 schools in the region. UAH was uniquely positioned to provide ongoing support of teachers in the region with an extensive history of strong teacher education and teacher in-service programs (http://uah.edu).

AAMU/UAH was one of eleven in-service centers established by the legislature in 1984. These centers were partnered with institutes of higher education (IHE) and ALSDE to serve the professional development needs of K-12 public school teachers in the state (http://www.aamu.edu/Academics/EHBS/centers/Pages/Regional-Inservice-Center.aspx).

The Alabama Math, Science, and Technology Initiative (AMSTI) was introduced by ALSDE in 2000 to improve math and science teaching statewide. Each AMSTI site was associated with one of the eleven Alabama regional In-Service Education Centers. Each AMSTI site was unique with varying ties to the partner university and to the corresponding in-service center. AMSTI UAH was selected as the first AMSTI site in 2002 in part because of its prior experience with an existing hands-on science program and materials center associated with the university. AMSTI UAH served 12 LEAs in 4 Alabama counties of northeast and north central Alabama during the program. AMSTI UAH was housed in the Institute for Science Education, UAH Shelbie King Hall, Huntsville, Alabama. AMSTI UAH served the counties of Madison, Jackson, Marshall, and DeKalb. Due to logistical reasons, AMSTI UAH was granted permission by ALSDE to work with schools in Morgan County and Athens City during the project years. Appendix A presents a map of AMSTI regional sites and the counties/LEAs they served during the program (http://amsti.org/Home/).

AMSTI UAH had several schools and lead teachers that had established Professional Learning Teams (PLTs) prior to receiving its first award through the ACHE NCLB higher education competitive grant program. This was due in part to its participation in Year One (Fiscal Year 2008-2009) of the program. This initial training would become important to the project in coming years as a major component of the *AMSTI Lead Teacher Enhancement Project*.

Year Five: Fiscal Year 2012-2013

AMSTI UAH along with other AMSTI sites submitted a successful proposal for year five (Y5). Objectives during Y5 included expanding the model developed during Y2 through Y4 to k-12 schools in the AMSTI UAH region.

A data driven approach to needs assessment focused efforts of PLTs established during previous years of the project. Math and science PD grounded in research on best practice was provided. Math content deepening utilized research from the Ongoing Assessment Project (OGAP). While many teachers had experienced OGAP in previous years, there were still many teachers that requested OGAP to help them align their instructional practice to state adopted standards for mathematics. ALSDE certified AMSTI specialists, trained in presenting OGAP, facilitated several PD sessions in Additive Reasoning, Multiplicative Reasoning, and Proportional Reasoning. This vertical approach to content deepening and alignment of PLTs was widely accepted by teachers and administrators seeking to strengthen their understanding of content standards in grades above and below the level in which they served.

Findings included commitment to project goals, engagement in activities of the project and capacity to carry out goals and activities of the project. Member schools were positively impacted by participation in the project through instructional reform and curriculum reform. Statistically significant increases in content knowledge resulted from participation in content deepening sessions as evidenced by scores on content knowledge tests. Participants reported satisfaction with project activities, positive attitudes relative to professional practice because of participation in their PLT, and statistically significant improvements in participant perception of their ability to use new knowledge learned during project activities as evidenced by responses reported on self-efficacy surveys.

Recommendations from the external evaluator included expanding content deepening opportunities in grade levels above and below grades served by teacher participants, expanding content deepening PD in STEM areas other than mathematics, development of PD activities that include upper grade (grades 9-12) math and science aligned with state standards, development of a model of sustainability for project goals and objectives including leveraging community and industry resources, and developing a process to monitor schools exiting the project to explore long term impacts on instructional reform and curricular reform.

Still missing was evidence of increases in teacher pedogeological content knowledge and student achievement. Those would remain a challenge to document through the next three years.

Year Six: Fiscal Year 2013-2014

PLTs continued to be added and content deepening in math and science continued during year six (Y6). Evaluation efforts built on previous years and findings continued to strengthen the conclusion that the project was reaching the intended goals of instructional and curricular reform.

Recommendations from the external evaluation of Y6 included providing additional support that reinforced Phase I training, developing a model for future growth and sustainability of the project over time, increasing efforts to include teachers from secondary grades (7-12) in the project, continuing to leverage resources including industry partners and PD opportunities, and developing a process to monitor schools exiting the project to explore long term impacts on instructional reform and curricular reform.

Year Seven: Fiscal Year 2014-2015

The project was successful in extending the model of instructional and curricular reform during year seven (Y7). Schools meeting project requirements were identified. Lead teachers and administrators from qualifying schools participated in Phase I activities intended to reform instruction through PLTs. Teachers from the AMSTI UAH service area participated in content deepening PD intended to enhance instruction and deepen understanding in standards based curriculum.

Survey data from Phase II PD indicated participant satisfaction with the content deepening sessions. Respondents reported that the sessions presented information that they could use in their class, presented information new to them, included strategies appropriate to the grade level that they taught, was well organized and presented, and involved fundamental concepts of the subject.

Recommendations by the external evaluator were along the same lines as previous years. The missing pieces of quantifiable data seemed to be teacher pedagogical content knowledge and student achievement. Sustainability of the model following cessation of support from the project was also seen as important.

Year Eight: Fiscal Year 2015-2016

AMSTI UAH submitted a successful proposal to ACHE for the *AMSTI Lead Teacher Enhancement Project* in Year Eight (Y8). The objective during Y8 was to expand the model utilized at other AMSTI sites during Year Two through Year Seven. The model included PD for a selected cadre of lead teachers and administrators from each participating school in the implementation of PLTs (phase one) and content deepening PD for lead teachers, administrators, and classroom teachers from the participating AMSTI sites (phase two).

PD utilizing the work of Ann Jolly was conducted for lead teams from selected schools in the AMSTI UAH service region. Teams included both teachers and administrators. Lead teams returned to schools with a written plan and resources necessary for creating PLTs that addressed unique needs within each school. With support from AMSTI specialists, PLTs were established in a number of school. The project provided funding for substitute teachers so that team members could meet regularly four full days or eight half days during school hours.

Content deepening PD during Y8 focused on improving math and science instruction alignment with state standards. Following a needs assessment along with collaboration with project partners, content deepening sessions were conducted. Support was provided by AMSTI specialists through contact hours during the school year. AMSTI specialists trained in instructional best practice worked closely with project teachers through mentoring, co-teaching, and modeling. The project did not provide stipends for participation but did provide training materials and resources including presenters.

Although there was not a formal external evaluation during Y8, findings indicated the project was successful in reaching the goals and objectives expressed in the proposal. Survey data from Phase I PD indicated improved confidence in establishing and conducting PLTs at their schools. Survey data from Phase II PD indicated participant satisfaction with the content deepening sessions. Respondents reported that the sessions presented information that they could use in their class, presented information new to them, included strategies appropriate to the grade level that they taught, were well organized and presented, and involved fundamental concepts of the subject.

WALLACE COMMUNITY COLLEGE SELMA- ALABAMA STATE UNIVERSITY

AMSTI Lead Teacher Enhancement Project

Clarence Pettway, Project Director

Year Seven: Fiscal Year 2014-2015

AMSTI WCCS-ASU submitted a successful proposal to join the *AMSTI Lead Teacher Enhancement Project* in Year Seven (Y7). The project built off prior efforts including *AMSTI Professional Learning Teams* in Year one led by the regional AMSTI site at the University of North Alabama and *AMSTI Lead Teacher Enhancement Project* in Years two through six led by AMSTI JSU and other regional AMSTI sites throughout the state.

Project objectives included instructional reform (Phase One) and curricular reform (Phase Two) in the project schools. The project was designed to provide professional development (PD) and support to a select cadre of lead teachers and administrators from Wilcox County Schools. PD relative to establishing, conducting, and sustaining Professional Learning Teams (PLTs) was provided based on best practice espoused in the seminal work by Anne Jolly (Jolly, 2007). This initial training was referred to as Phase One and was conducted by Tanya Barnes, ALSDE Liaison and former AMSTI Jacksonville State University Site Director. Mrs. Barnes was an accomplished PLT presenter and had extensive experience in planning and developing effective PD for PLTs. Lead teams returned to schools with a written plan and resources necessary for creating PLTs that addressed unique needs within each school. With support from AMSTI and ALSDE specialists, PLTs were established in several Wilcox County schools. The project provided training resources and funding for substitute teachers so that team members could meet regularly four full days or eight half days during school hours.

Content deepening PD during Y7 focused on improving math and science instruction alignment with state standards. Following a needs assessment along with collaboration with project partners, content deepening sessions were conducted in the Ongoing Assessment Project (OGAP, http://www.ogapmath.com/) and alignment of mathematics curriculum with state standards. The PD was presented by trained presenters in Additive Reasoning and Multiplicative Reasoning and was focused on formative assessment of student work and learning progressions. The PD was supported by AMSTI specialists through contact hours during the 2015-2016 school year. AMSTI specialists trained in instructional best practice worked closely with project teachers through mentoring, co-teaching, and modeling. The project did not provide stipends for participation but did provide training materials and resources including presenters.

Evaluation of the project was conducted and reported by an external evaluator. Evaluation measures included satisfaction and post reflective surveys, site visits to AMSTI WCCS-ASU, PLTs, and PD sessions, observation rubrics, and content pre-post measures.

Findings by the external evaluator included increased lead teacher satisfaction and self-efficacy in establishing conducting and maintaining PLTs, increased teacher satisfaction and self-efficacy in using and sharing the content from PD presented, satisfaction and adherence to state and national standards for PD, and statistically significant increases in teacher content knowledge relative to the content presented during the PD sessions.

Recommendations from the external evaluator included conducting refresher training for struggling teams focused on purpose and rewards of establishing PLTs. Careful observations and monitoring of PLTs were also seen as important to reaching project goals and objectives.

Sustainability of the project was a challenge mentioned in the evaluation. To address this issue, it was recommended that project leadership engage district leadership in ways to sustain the momentum established by the project during Y7.

Year Eight: Fiscal Year 2015-2016

The objective during Y8 was to expand the model utilized during Year Seven. The project provided training resources and funding for substitute teachers so that PLTs could meet regularly four full days or eight half days during school hours.

Content deepening PD during Y8 focused on improving math and science instruction alignment with state standards. Following a needs assessment along with collaboration with project partners, content deepening sessions were conducted in spring, summer, and fall 2016. Support was provided by AMSTI specialists through contact hours during the school year. AMSTI specialists trained in instructional best practice worked closely with project teachers through mentoring, co-teaching, and modeling. The project did not provide stipends for participation but did provide training materials and resources including presenters.

Activities during Y8 included: 1. Selection of qualifying schools based on specific criteria including high needs and low performing schools; 2. Implementation of a proven strategy of establishing, conducting, and sustaining PLTs in Phase One Schools (Instructional Reform); 3. Implementation of Content Deepening in Phase Two Schools (Curriculum Reform).

Preliminary findings indicated the project was successful in reaching the goals and objectives expressed in the proposal. Survey data from Phase I PD indicated improved confidence in establishing and conducting PLTs at their schools. Survey data from Phase II PD indicated participant satisfaction with the content deepening sessions. Respondents reported that the sessions presented information that they could use in their class, presented information new to them, included strategies appropriate to the grade level that they taught, were well organized and presented, and involved fundamental concepts of the subject. Findings relative to improvements in teacher content knowledge during Y8 were inconclusive. Challenges with choosing an appropriate measure, administering the measure, and interpreting data relative to PD

topics may not have reflected the true impact of the project on teacher content knowledge during Y8. The missing pieces of quantifiable data seemed to be teacher pedagogical content knowledge and student achievement. Sustainability of the model following cessation of support from the project was also seen as important.

AUBURN UNIVERSITY

AMSTI Lead Teacher Enhancement Project

Mary Lou Ewald, Project Director
Ms Elizabeth Hickman, Project Administrator

Year Seven: Fiscal Year 20015-2016

AMSTI-AU received its first ACHE grant award for 2015-2016. The vision of the project was to develop capacity in the participating Lead Teachers to facilitate Professional Learning Team meetings and for those Lead Teachers to serve as front-runners in implementing curricular and instructional changes in mathematics instruction in their schools.

Evaluation findings included: goals of the project were carried out; participating in the project positively impacted the participating schools instructional reform and curriculum reform; teacher content knowledge was increased and sustained at a seven-month follow-up. Participants reported satisfaction with project activities, positive attitudes relative to professional practice as a result of participation in their PLT, and improvements in participant perception of their ability to use new knowledge learned during project activities as evidenced by interview data. It was recommended that additional supports be provided to reinforce Phase I training as well as developing a model for future growth and a plan to sustain and explore long-term impacts of the project.

Year Eight: Fiscal Year 2016-2017

AMSTI-AU received its second and final ACHE grant award for 2016-2017. The vision of this project was to build capacity in all math teachers in the participating schools as they continued to develop PLTs and implement curricular and instructional changes in mathematics instruction. Anecdotal evidence demonstrated that the vision was achieved.

TROY UNIVERSITY

AMSTI Lead Teacher Enhancement Project

Kimberly Dove / Ms Sherrie Blackmon, Project Directors

Year Eight: Fiscal Year 2016-2017

AMSTI Troy submitted a successful proposal to join the *AMSTI Lead Teacher Enhancement Project* in Year Eight (Y8). The objective during Y8 was to expand the model utilized at other AMSTI sites during Year Two through Year Seven. The model included PD for a selected cadre of lead teachers and administrators from each participating school in the implementation of PLTs (phase one) and content deepening PD for lead teachers, administrators, and classroom teachers from the participating AMSTI sites (phase two).

PD utilizing the work of Ann Jolly was conducted for lead teams from selected schools in the AMSTI Troy service region. Teams included both teachers and administrators. Lead teams returned to schools with a written plan and resources necessary for creating PLTs that addressed unique needs within each school. With support from AMSTI specialists, PLTs were established in a manageable number of school. The project provided training resources and funding for substitute teachers so that team members could meet regularly four full days or eight half days during school hours.

Content deepening PD during Y8 focused on improving math and science instruction aligned with state standards. Following a needs assessment along with collaboration with project partners, content deepening sessions were conducted in spring, summer, and fall 2016. Support was provided by AMSTI specialists through contact hours during the school year. AMSTI specialists trained in instructional best practice worked closely with project teachers through mentoring, co-teaching, and modeling. The project did not provide stipends for participation but did provide training materials and resources including presenters.

Activities during Y8 included: 1. Selection of qualifying schools based on specific criteria including high needs and low performing schools; 2. Implementation of a proven strategy of establishing, conducting, and sustaining PLTs in Phase One Schools (Instructional Reform); 3. Implementation of Content Deepening in Phase Two Schools (Curriculum Reform).

Preliminary findings by the external evaluator indicated the project was successful in reaching the goals and objectives expressed in the proposal. Survey data from Phase I PD indicated improved confidence in establishing and conducting PLTs at their schools. Survey data from Phase II PD indicated participant satisfaction with the content deepening sessions. Respondents reported that the sessions presented information that they could use in their class, presented information new to them, included strategies

appropriate to the grade level that they taught, were well organized and presented, and involved fundamental concepts of the subject.

Findings relative to improvements in teacher content knowledge during Y8 were inconclusive. Additional data collection was planned for May 2017 in PD relative to math and science content deepening as well as data collection relative to PLTs. Challenges with choosing an appropriate measure, administering the measure, and interpreting data relative to PD topics may not have reflected the true impact of the project on teacher content knowledge during Y8.

Preliminary recommendations by the external evaluator were along the same lines as those from other project sites and previous years. The missing pieces of quantifiable data seemed to be teacher pedagogical content knowledge and student achievement. Sustainability of the model following cessation of support from the project was also seen as important.

SUMMARY

Data reporting throughout the life of the program demonstrated outreach to hundreds of teachers and thus thousands of students across the state. Teacher and administrator collaboration through PLTs and content deepening activities were important to instructional and curriculum reform in participating schools. Perhaps one of the most significant outcomes of the projects was the implication of what is possible through collaborative efforts of communities, LEAs, state and national education agencies to improve education for the children of our state.

Important lessons learned during the project included the unique nature of each AMSTI site. Each site brought to the project a unique set of challenges and skills that include partnership with in-service education centers, university affiliation, and LEAs. Each site was uniquely positioned to leverage resources within its region including community and private business.

Another important lesson learned was the blurring of lines between AMSTI and the project. Throughout the life of the project, there seemed to be little distinction between the work of AMSTI and activities supported by the project. This lesson learned made clear that there existed a symbiotic relationship between the two. Without the support of AMSTI, there could be no project. Without the project, AMSTI sites could not offer the enhanced level of support in creating effective teacher and administrative PLTs, PD opportunities, and resources within their regional site.

Moving forward, building leadership potential evident in selected cadres of lead teachers through a focused and deliberate approach to curriculum and instruction seemed to be the logical next step. LEA leadership adopting this culture of professional collaboration through job imbedded PLTs seemed to be the key to sustaining momentum achieved over the past eight years.

One key to sustainable instructional and curricular reform seemed to be in effective teacher certification programs. Many teachers, particularly those teaching grade kindergarten through grade five, were heard to comment that their certification programs had not prepared them with the content knowledge required by the emergent standards in science and mathematics. Collaboration with teacher certification programs including preparation in alignment of curriculum with standards of science and mathematics instruction should be explored. Inclusion of standards based instruction at undergraduate and graduate level teacher certification may become a major component of future attempts to impact true reform.

No history of the projects would be complete without acknowledgement of the hard work and dedication of the men and women who were AMSTI/ASIM Directors, Assistant Directors, and Math and Science Specialists across the state. Most were former teachers from the respective service areas. Expertise in their grade level standards and subject area content knowledge was a significant reason for the success of the projects. Thus, a culture of respect and trust developed between AMSTI/ASIM staff and the teachers

they served. As more than one AMSTI staff member was heard to say, “This is what we do. This is what we are.”

REFERENCE

Jolly, Anne. *Team to Teach: A facilitator’s guide to professional learning teams*. 2008. National Staff Development Council. Oxford, OH.

Comprehensive Arts Education

University of South Alabama (USA) /

Alabama Institute for Education in the Arts (AIEA)

Dr. Jeannette Fresne / Martha Lockett / Linda Dean, Project Directors

Project Summary (1995 – 2017)

The Comprehensive Arts Education: Alabama (CAE) project began in the academic year 2005–06 through a newly developed partnership between the Alabama Institute for Education in the Arts (AIEA) and University of South Alabama's (USA) Arts in Education (AiE). Working together to provide on-going, intensive professional development training in comprehensive arts education for teachers and administrators through Alabama, this partnership enabled both organizations to meet the needs of substantive professional development in arts integration for Alabama teachers more effectively.

Prior to 2005, AIEA and AiE received funding separately. AIEA received funding from the Eisenhower grant and ACHE-NCLB from 1995 through 2005 for professional development programs in arts education. In 2004, Dr. Jeannette Fresne at USA received funding from ACHE-NCLB for a first-year arts-integration project, Arts in Education (AiE). In 2005, AiE and AIEA created an umbrella program, Comprehensive Arts Education: Alabama (CAE), which made arts integration programs available statewide.

Depending on the program, teacher-participants attending CAE spent 40 to 55 hours in direct instruction within a 12-month period. CAE immersed teachers in dance, music, theatre, and visual art – through lecture, demonstration, and hands-on participation – learning what students needed to know and discovering the tools with which they could share this new approach to learning. They received resources as presenters modeled exemplary teaching practices. In all areas, teachers worked with artists and attended live performances to recognize the importance of providing these experiences for their students. The curriculum carefully addressed specific objectives:

- Informed participants about music, theater, dance, visual art as art forms and academic disciplines.
- Acquainted participants with a variety of resources and instructional strategies.
- Encouraged the process of student discovery through a teacher led inquiry model that encourages critical thinking and higher order thinking skills.
- Assisted participants in designing and implementing a comprehensive arts education program in their school.
- Examined the relationships between educational works of art and whole language, interdisciplinary studies, interrelated arts, learning modalities, higher-level thinking and problem solving, cooperative learning, and multiculturalism.

As a conceptual framework, CAE was a vehicle for ensuring that all students, not just the gifted/talented, were involved in a rigorous study of the arts as part of their general education. It also served as an innovative, but fundamental, approach to integrating the arts into the curriculum, permitting students at all levels, in any course of study, to understand and participate in, an art form within the structure of a typical school day. CAE promoted interdisciplinary study from four perspectives corresponding to the three strands in the ALCOS:

- Understand
    - History: encountering the historical/cultural background of works of art
- Respond
    - Aesthetics: discovering the nature and philosophy of the arts
    - Criticism: making informed judgments about the arts and being able to justify those judgments
- Produce
    - Production: creating or performing

NCLB legislation placed the arts in the core academic curriculum. The ALCOS: Arts Education only recommended 60 minutes of arts instruction per week for all K-6 students. NCLB legislation required that teachers be highly qualified and effective in all subjects in which they taught, yet most Alabama schools had few, if any, arts specialists. The general classroom teacher at the elementary level may or may not have had one introductory course in music and visual art, depending on their university degree program. At the secondary level, few teachers had any coursework connecting the arts curriculum with their content area. With the gap between teacher training and a mandated arts curriculum, CAE was able to fill the gap.

Participants stated that they achieved the level of skills and knowledge necessary to implement the arts education requirements. Additionally, CAE sessions presented developmentally appropriate practices available for guiding students in making informed decisions about the arts - enhancing student's understanding of the aesthetic qualities of works of art, teaching students to identify key elements and characteristics in works of art, utilizing discipline-based techniques to supplement instruction in diverse subject areas, providing students with historical and cultural backgrounds relating to works of art, designing and implementing discipline-based arts education curriculum, and appreciating and understanding the art forms of various cultures.

CAE helped ensure that classroom teachers were able to teach arts content in an authentic and adequate manner. Attendance was open to all public and private school educators, including ELL teachers and special needs teachers who found arts integration amazingly effective in helping students develop oral language skills. Teacher-participants, concurrently enrolled in AiE, could enroll in a three-hour graduate course at USA designed to provide a deeper level of arts integration more specifically tailored to the children in their classroom. CAE offered several sessions with a technology focus, covering such topics as the creation of wikis, digital storytelling, and exploring free arts downloadable software. This training supported AMSTI and addressed the need for increased technical expertise.

CAE modeled best practices identified in current research on professional development to effect systemic change in the schools. With Principal support critical, administrators attended 2½ days of Administrator's Leadership strand in the AIEA Summer Institute. They focused on staff involvement, professional development, long-range and short range planning, their role as instructional leaders and understanding the conceptual framework of comprehensive arts education. During site visits, the Director of the Leadership strand focused on concerns expressed by administrators offering suggestions of best practice, ideas for resources and guidance in planning and funding issues.

AIEA and AiE developed a strong partnership with the State Department of Education (SDE). AIEA provided arts professional development to schools in the two-year School Improvement project, 2011–13, and was the main provider for the Alabama Black Belt Arts Education Initiative funded by the SDE. The SDE contacted AIEA in 2014 and awarded an additional contract to provide scholarships and training to Alabama's schools in comprehensive arts education; this was renewed and expanded for 2015. As of this writing in 2017, Martha Lockett, AIEA's ACHE Grants Coordinator, and Randy Foster, the Executive Director of AIEA, serve on the Arts Education Leadership Task Force convened by the State Superintendent and the Director of Alabama State Council on the Arts. Additionally, Foster currently serves on the five-member Executive Committee. Results from this work may lead to a research-based recommendation for the future of arts in Alabama schools.

All CAE programs provided time to develop comprehensive arts lesson plans in each area. Participants at AIEA spent debriefing time each day looking at the lessons presented and identifying how to meet or exceed these standards in each classroom. AiE devoted extended time and support for teacher-participants in developing and disseminating quality lesson plans created by our participants. Each lesson plan or unit identified ALCOS standards, providing interdisciplinary connections or webbing to other content areas. Evaluations indicated that this was vitally important.

CAE provided statewide intensive, comprehensive arts education professional development for Alabama teachers, including graduate coursework through USA. All pre-service students at Judson College were required to attend a series of SuperSaturday sessions, developing and using CAE content in their classroom experiences. AIEA staff worked in the education classes at Troy University, University of Mobile, and Auburn University Montgomery introducing students in teacher preparation programs and teachers in administration programs to the importance of arts in the classroom and ways to incorporate the learning. Fresne and Jessica Freeland, AiE Program Manager, conducted arts integration sessions with the graduating education majors at the University of Mobile in December and/or May for several years and Fresne presented arts integration to graduate students at The University of Utah. USA students enrolled in music education courses were required to attend a minimum of one session of AiE, while elementary education students were offered extra credit for attending. (Neither group incurred additional cost by attending.)

Due to their research in presenting for AiE, several USA professors (Fresne, Giles, Santoli, Vitulli) presented arts integration at conferences, local and international, and published articles and book chapters. Several other presenters (Freeland, Dr. Donna Louk, Ella Smith, etc.) and participating teachers (Ella Smith, Emily Baker, etc.) presented at conferences or wrote about arts integration, also (see appendix G).

The AIEA Summer Institute consisted of five concurrent workshops: Visual Art, Theater, Music, Dance, and Administrative Leadership. Sessions were engaging, involved and included two evenings of multi-arts activities.

ACES for Students (Arts Connections Encourage Success for Students) placed a Music/Theatre teaching artist in all Vaughn Road Elementary K-5 grade classrooms for 30 minutes each week and a Movement teaching assistant in those same classrooms every other week for 30 minutes. There were two full planning days with the teachers and teaching assistants at the beginning of each semester. All lessons focused on literacy, vocabulary needs, and items on the year-end tests that the students historically had difficulty mastering. At the end of the 2015-16 school-year, there was a compendium of field-tested, experiential K-5 grade lessons using the basic concepts of the art form to teach and reinforce content. 2015-16 was the final year of the project. Funds were secured to continue the artists in K-3 grade as well as begin work in grades 4 and 5. At the end of the three-year cycle, a bank of lessons for Kindergarten through 5th grade was created and AIEA had a usable and vetted model for training that could be done on-site in a system or off-site at a central location.

AIEA offered 3 to 5 SuperTraining days, which were also called *SuperSaturdays*, through which teachers receives in-depth training developing teaching strategies and production skills in a specific arts form. AIEA offered a series of support services for schools and teachers in the project. (1) Staff visited the classrooms of participants to provide support and feedback with additional visits for schools in School Improvement. (2) Staff provided model lessons and consultations in the classroom; helped teachers find resources to write grants; located presenters; and did needs assessment. (3) SuperTrainings offered teachers a chance to ask questions, share successes and challenges with their peers and instructor, celebrate a newly discovered personal “talent” or arts-connection, and receive new units and resources.

From 2004-2018, the AiE projects conducted a total of 85 – 144 hours (plus mentoring) of professional development training every year. Depending on the program, participant-teachers attended 35-49 hours of intense training over a period of five or six months. From 2004 through 2018, AiE provided intensive, long-term arts integration education for elementary classroom teachers, principals, and paraprofessionals. From 2010 to 2014, AiE provided an additional intensive, long-term arts integration program designed specifically for English and social studies middle school teachers in addition to continuing to offer the elementary program. In 2014, AiE began offering arts integration training designed specifically for middle school math teachers. Employing approximately fifteen university professors, artists, artist-teachers, and teachers, the curriculum was grounded in DBAE, developmentally appropriate practice, ALCOS requirements, and the national arts standards. The only one of its kind in southern Alabama, AiE provided

not only 35-49 hours of professional development each year for elementary classroom teachers, 42 hours for middle school English and social studies teachers and 36 hours for math teachers but also supported teacher-participants through six hours of mentoring (on-site, one-hour visits) throughout the year by the AiE instructors in the teacher's classroom.

AiE provided several venues of support for its participants beyond the training sessions. (1) Instructors provided on-site mentoring during the weeks following the training and encouraged teachers-participants to communicate with the instructors via email. This allowed our participants to develop mentoring relationships with many of the instructors and receive support when reticent about integrating a particular art area. (2) Our instructors provided additional, stand-alone workshops at a school or at the central office when requested. (3) AiE offered Reunions for past participants, providing innovative arts integration for teachers having completed the AiE programs since 2004.

The combination of AIEA and AiE sessions as CAE shared similarities in the quality of instruction, mentoring opportunities for participants, time devoted to writing arts integrated lesson plans by individuals and teams and kits provided to teachers, administrators and paraprofessionals during the sessions for content implementation.

External evaluators provided additional insight throughout the years in the evaluation of meeting the project goals. Consistently, external evaluators reported significant gains in knowledge. In 2005, Katherine Whitely, PhD, reported that "84% of the participants felt the goal was mostly achieved, or better." In 2006, Dr. Jo Alexander noted the similar characteristics as AIEA and AiE combined as CAE. "The evaluator is in concurrence with the philosophy, goal, objectives, and focus of the administration of AIEA and AiE. The personnel are innovative, experienced and student-centered." A report generated by The University of Alabama at Birmingham (UAB) stated the following:

> Quantitative (pretest/posttest tests) methods were used to evaluate the subject matter knowledge gains of workshop participants. Four topics (dance, music, theater, and visual art) were assessed on five pretest/posttest evaluations…. Results... demonstrate that statistically and practically significant gains were made by participants on all tests. Effect sizes for the statistically significant gains ranged from 1.55 to 4.29. Effect sizes of greater than .33 standard deviations are typically considered to be practically meaningful. Gains in excess of one standard deviation indicate a substantial shift in content knowledge in the content tested. The rigor of the content assessed by these tests is apparent in the rather low scores on the pretests and the evidence that the average posttest scores range from just 49% to 92%. (2008)

The results generated by UAB in 2009 indicated that one-third of the teachers thought it was likely to occur or would always occur "…for a visitor to their classroom to have observed the teacher integrating the arts into his/her subject content." Charlotte Taberaux, PhD, noted the following year that CAE was "extremely fortunate to have the ACHE's support to produce the exceptional arts integration programs for

the teachers in the state…" (2010). Dr. Rodney Davis served as the external evaluator for several years. His reports consistently noted that CAE "achieved its stated objectives."

> If any program, strategy, methodology, and/or philosophy can save public education and re-engage students with learning it will be through AIEA or AiE. I am convinced that the program was implemented according to the plan outlined in the project grant. All objectives were addressed as stated. (2011)
>
> The [participant] comments are 'glowing' and in many cases report that nothing needs to change. The strength of this data confirms that the program is meeting its objectives…. (2012)
>
> Upon reviewing the data, it is the opinion of the external evaluator that the project achieved its stated objectives. (2013)
>
> I continue to see improvement in all aspects of your program. This claim is supported by the fact that, once again, almost 100 percent of the participants strongly agree that the training was valuable. (2014)
>
> …AiE and AIEA… programs are the best programs I have ever witnessed. This statement is based upon the quality of the presentations, activities, and resource materials. There are only a few conferences one could attend and hear presenters of the caliber of those at AiE or AIEA. In addition, there are no conferences that I am aware that provide participants materials valued between $200 and $300. It is just not done. Lastly, there are no conferences that provide participants with the hands-on learning activities that this training does. For these reasons, I am convinced that there is a national model here for infusing the arts into the instruction of core content… Even though there are slight differences in the implementation of the program between AiE and AIEA both programs could be replicated in every state where there was a will to provide arts-based education for the students. It is my hope that these programs will receive increased funding in the years to come because they have shown the impact of the training by the participant ratings and their supportive comments. (2015)

While the programs of CAE continued to evolve through the years as the needs of the teachers of Alabama evolved, the external evaluators of CAE continued to note the meeting of objectives and continuity of quality instruction, materials, and mentoring.

Disaggregated data indicated that children of poverty, children of color, children with special needs, and ELL students were failing to succeed at an appropriate degree in Alabama schools. Studies in 2007 and 2008 from the Center on Education Policy found, "Among districts that reported a decrease in instructional time since 2001–02, 23% reported decreasing total instructional time for arts and music by 50% or more below pre-NCLB levels - greater than social studies, science and physical education." While desirable for specialists to teach the arts, general classroom teachers usually teach the arts with little, if any, training (Model Standards for Licensing Classroom Teachers and Specialists in the Arts, developed by the INTASC Arts Education Committee and the Chief State School Officers Council, 2002.) INTASC stressed that classroom teachers must have a "basic foundation of knowledge and skill" in each of the arts areas and encourages a

“collaborative framework” between the art specialist and the classroom teacher to provide quality arts instruction and arts integration into the general curriculum.

While the Alabama Institute for Education in the Arts and Arts in Education offered professional development that taught the arts through multiple philosophies and methodologies, our goal was to reach children – helping them retain information at a higher level, introducing them to new and different ways of processing information, and presenting the joy of learning through discovery and experiential learning. Our goal was to meet the mandates of our funding agencies because we agreed with their focus. Ultimately, we taught subjects, philosophies, methodologies and approaches to learning but we never forgot that we were teaching people. The opportunity to work with adults in professional development training and children in Kindergarten through High School during mentoring was the greatest honor afforded everyone involved in the program.

We fondly thank the Alabama Commission on Higher Education for the grant that allowed over 3,000 teachers to experience a better approach to teaching and provided over 400,000 students (in each of the 3,000+ teachers year of training) the benefit of better learning. Over the years, the number of students impacted by these 3,000+ teachers will reach into the millions. We hope that learning through the arts, participating in the arts, and enjoying the arts continues for many years.

IMPACTSEED
(IMproving Physics And Chemistry TEaching in SEcondary EDucation)

Jacksonville State University

Dr. Nouredine Zettili, Project Director

Project Summary (2002 – 2017)

1. Historical Introduction: IMPACTSEED Origin & its Necessity How this project started? Around 2000 when I (Project Director and Principal Investigator) was teaching freshman physics at Jacksonville State University (JSU), I noticed that the students' background in physics and mathematics was consistently weak. I have checked with my other colleagues who were teaching physics and chemistry and they confirmed the same observation. The students' high school physics and chemistry backgrounds were so weak that most of them end up avoiding majoring in STEM (Science, Technology, Engineering, and Mathematics) fields altogether. As a result, I have conducted a series of surveys to understand the root cause of this phenomenon. The conclusion reached indicated that most of JSU's freshman students have never taken physics nor chemistry in high school and the few who did, I wished they never did. The subjects were so poorly taught to them that we, at JSU, end up spending enormous efforts and time trying to deprogram them to undo the damage. Teaching physics and chemistry to a student who has never taken any before is a lot easier than teaching them to students who learned them wrong in the first place.

But why the education of physics and chemistry in high school is poor? In trying to understand this problem, I have conducted extensive surveys among chemistry and physics high school teachers in northeast Alabama and managed to pinpoint the root cause of the problem: most physics and chemistry educators in our region teach out of field. Around 2003, 83.3% of the chemistry teachers, and 94.4% of the physics teachers were teaching out field (see Table 1 below). Teaching out of field meant these teachers lacked even minors in chemistry or physics; obviously, none of them had degrees in these fields.

	Math	Biology	Chemistry	Physics
National Average	31.0%	NA	NA	55.0%
State Average	NA	31.0%	60.1%	84.6%
Local Average	36.4%	34.1%	83.3%	94.4%

TABLE 1: Percentages of Teachers Teaching Out of Field

The acute shortage in qualified high school science teachers in this area compelled school officials to task teachers with substandard credentials (or no credentials at all) to teach physics and chemistry. The consequences of this unfortunate problem are unavoidably incalculable, yet predictable. We can mention, for instance, two obvious outcomes. First, when physics and chemistry are poorly taught to high school students, they tend to think that these subjects are inherently hard. In fact, when we surveyed the freshman students, they invariably said that physics and chemistry are hard and intimidating to the point where most of them end up avoiding these subjects altogether and opting for non-science courses and majors. This trend is a source of concern to any university faculty, especially that physics and chemistry are considered to be the backbone of STEM fields and even life sciences. Second, when these students (i.e., those who avoided physics/chemistry in high school) reach college, they invariably avoid pursuing careers in STEM fields as well because their high school education has not prepared them for that. This is a terrible loss indeed. Had these students been in good hands (i.e., taught by qualified and knowledgeable physics/chemistry instructors), some of them could very well end up becoming world-class scientists or engineers. A big loss of potential talent at such an early stage.

Things were exacerbated by the fact that JSU -- the major university serving northeast Alabama -- offers B. Sc. degree programs in Education in the fields of Biology, Math, and General Science, but none in physics nor chemistry! The pre- service curricula of biology and math include not a single course in physics, while the students majoring in the General Science Education program take only two freshman level courses of algebra-based physics. Yet, the vast majority of students majoring in General Science Education have been assigned high school physics and chemistry courses, something their education never prepared them for. So, the source of the problem lies right here: Most of the teachers who are called on to teach high school chemistry and physics had no formal training in them!

In view of the findings outlined above that were obtained in 2001, I became convinced that the most optimal and most expeditious way to help improve the education of physics at the high school level in JSU's service area -- northeast Alabama -- was to offer sustained professional development as well as year-round support to secondary education teachers. As a result, I wrote a grant proposal, called Strengthening Physics IN SEcondary EDucation (SPINSEED), and submitted it to the Alabama Commission on Higher Education (ACHE); ACHE funded SPINSEED for the 2002-2003 academic year as part of the Eisenhower grants legislation. During SPINSEED's 2002 Summer Institute, we had 23 participants. At the conclusion of that Summer Institute, I, along with my SPINSEED's staff colleagues, have surveyed the teachers on the subjects they like to study during Summer 2013 and they invariably asked us to add chemistry since most of them were teaching both physics and chemistry at their schools. As a result, I decided to expand SPINSEED to include chemistry to address this need. A such, I wrote a second grant called IMproving Physics And Chemistry Teaching in SEcondary EDucation (IMPACTSEED) and submitted it to ACHED. It got funded during 2003-2004 as part of the No-Child Left behind Initiative (NCLB). Due to the continuous demand on the program and the dedication of the participants, we ended up offering IMPACTSEED for about 15 years now -- between 2003-Present.

It helps to note that IMPACTSEED has lasted this long due to the confluence of several factors. First, the need for a professional development program in chemistry and physics has been real due to the absence of teachers with degrees in these fields. Second, when a teacher who, for instance is a biologist or a general science major, is asked to teach chemistry or physics, her/his training has not prepared her/him for teach out of field; for these teachers, IMPACTSEED becomes a necessity. So, due to the continuous change in the teaching assignments of teachers at their schools, non- chemistry and non-physics major teachers have been attending IMPACTSEED year after year. Every year, we have been receiving continuous influxes of new participants due to this change of teaching assignment. Third, IMPACTSEED has lasted this long primarily due to its effectiveness in offering real support to the participants and in making them become better teachers as the testimonies below show.

2. IMPACTSEED's Objectives

From the very outset, we have defined two major goals to achieve:

1. to ensure that our area high school students receive high quality instruction in chemistry and physics from knowledgeable, well-trained, and well-supported teachers; and
2. to produce a critical mass of high school graduates who are well prepared to successfully major in STEM fields at the university level.

To achieve these two main goals, we decided to focus on the training of the teachers. Hence, the primary focus of IMPACTSEED has been to provide comprehensive training -- professional development in contents, pedagogy, and technology -- for chemistry and physics teachers that is in alignment with state and national standards. In the process, we have focused on helping our area teachers achieve a double aim:

a) to make physics and chemistry understandable and fun to learn within a hands-on, inquiry-based setting;
b) to overcome the fear-factor for physics and chemistry among students and teachers alike.

3. Achievement of IMPACTSEED's Objectives

3.1 Steps Undertaken to Achieve IMPACTSEED's Objectives

To achieve the objectives outlined in the previous section, we have identified (back in 2002) and undertaken a number of concrete steps:

1. Provided professional development by systematically covering the entire chemistry and physics programs of the Alabama Course Of Study (ACOS) and finishing them every three years, and then start over again.
2. Delivered the chemistry and physics contents in an inquiry-based instruction; the primary emphasis was on discovering rather than memorizing in which instruction was based on questioning rather than telling.
3. Developed a number of technology projects that supported the various topics we have covered in class.

4. Provided the teachers with a number of teaching kits and modules (at the conclusion of every summer institute) they have utilized in their classrooms to support their instruction within a hands-on, inquiry-based approach.
5. Prepared the entire chemistry and physics programs on Compact Discs (CDs) and given them to the teachers at the conclusion of every summer institute. The CDs contained lecture notes, lesson plans, work sheets, homework assignments, quizzes, tests along with solutions, and powerpoint presentations that span Grade 12 programs of chemistry and physics for an entire year. The CDs contained several versions of the worksheets and quizzes; i.e., with student versions and teacher keys along with worked-out solutions. Equally important, we have trained the teachers on how to utilize the contents of the CDs during the summer institutes.
6. Visited the teachers at their respective schools and offered chemistry and physics demonstration sessions to their students.
7. Provided graduate credit in chemistry and physics for those teachers who were interested in pursuing MS and doctorate degrees in science education.

To implement the above mentioned concrete steps, we have operationally undertaken the following five major activities every year during the 15 years of implementing IMPACTSEED:

1. During every summer, we have offered an intensive, two-week long summer professional development institute where the teachers received training on the contents, pedagogy, problems solving skills, and the use of technology to support the teaching of chemistry and physics within a hands-on context. The primary emphasis of the delivery was on discovering and inquiry-based rather than passive standard lecturing format.
2. During every academic year, we have offered a series of 5 Technology Workshops designed to bring technology into classrooms by showing the many applications of physics and chemistry in our daily lives and industry.
3. We have offered sustained, year-round on-site support to the teachers; we have visited the teachers at their schools and offered demonstration sessions to their students.
4. We have established year-round physics and chemistry hotlines to offer immediate support to the teachers whenever the need occurred.
5. We have established a website to disseminate the results of the project statewide and to list useful chemistry and physics resources for the teachers; the website has served as a potent networking outlet for the chemistry and physics teachers throughout Alabama.

3.2 Objectives Achieved

Since we have trained about 359 teachers (see Appendix) who, in turn, had taught about 32,682 students (see Figure) over the last 15 years, we can assert the following:

1. IMPACTSEED participants have received effective training to the point of having gained confidence and delivered potent instruction in chemistry and physics to their students, even though they did not hold degrees in these subjects; they were teaching them on an out of field basis.
2. According to the various external evaluation reports, the average knowledge gain achieved by the teachers at the conclusion of every summer institute was over 50%, both in chemistry and in physics.
3. The high school students taught by IMPACTSEED teachers have been receiving high quality instruction in chemistry and physics from knowledgeable, well-trained, and well-supported teachers.
4. A good number of students from IMPACTSEED's participating schools have won university scholarships and ended up majoring in STEM fields. Some of them have already completed their PhD studies and are serving in national research labs, while others are university faculty members

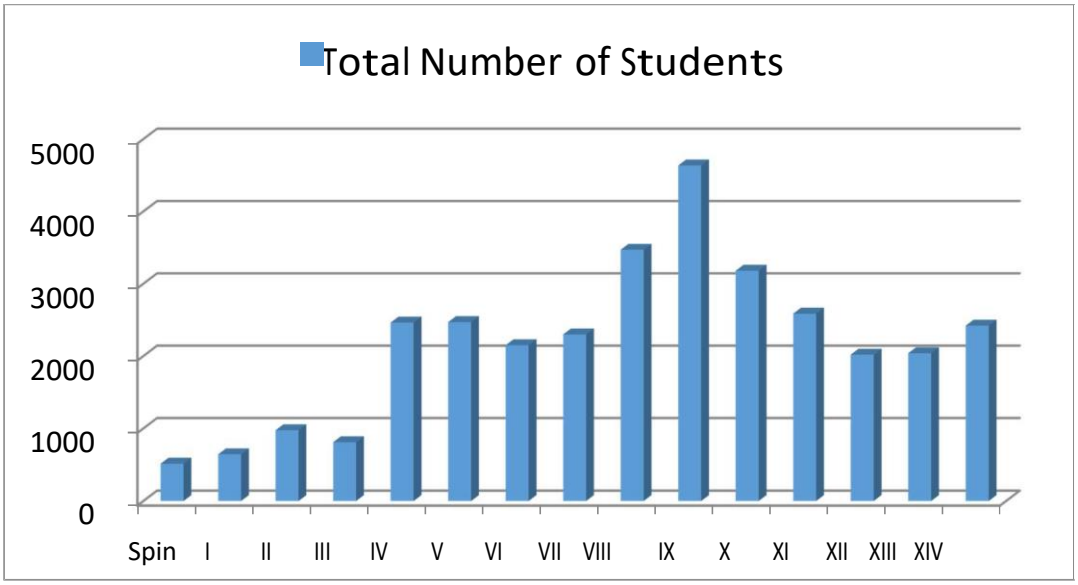


FIGURE 1: Total Number of students taught by IMACTSEED Teachers between 2002-2017.

3.3 IMPACTSEED's Key Performance Indicators

The success of IMPACTSEED can be quantitatively be measured by its key performance indicators (KPIs). The major KPIs that were achieved between 2002-2017 can be distilled in the following:

1. We have trained about 359 secondary education teachers in chemistry and physics.
2. IMPACTSEED participants have taught about 32,682 students over the last 15 years.
3. Many of IMPACTSEED teachers have introduced Advanced Placement (AP) courses in chemistry and physics in their respective schools.
4. As reported by a number of IMPACSEED teachers, the performance of their students in standardized tests, such as ACT, has improved noticeably.

5. Relying on the support IMPACTSEED, a number of teachers have successfully completed their MS degrees in science education with concentrations in chemistry and physics.
6. Several of IMPACTSEED teachers have also successfully completed their doctoral degrees in Science education with concentrations in chemistry and physics.
7. A number of students from IMPACTSEED's participating schools have ended up majoring in STEM (Science, Technology, Engineering, and Mathematics) fields at the university level; some of these students are already serving in national research labs and others occupying faculty positions in prominent universities.
8. We have seen a measurable increase in the number of IMPACTSEED students majoring in science fields such as chemistry and physics at Jacksonville State University (JSU).
9. The students from IMPACTSEED's participating schools who have been accepted to JSU are far better prepared in science than students from schools that did not participate in IMPACTSEED.
10. IMPACTSEED's contributions were recognized and featured on many articles in regional newspapers as shown in the Appendix.
11. IMPACTSEED was featured in the 2008 Annual Report in the international publication of Fulbright scholars.

3.4 Evidence: Input from IMPACTSEED Participants

In preparing this historical report, we have recently surveyed the teachers who have participated during the last 15 years of IMPACTSEED's operation. The evidence and testimonies collected indicate that IMPACTSEED has indeed delivered on its core objectives.

Here are some representative testimonies (listed verbatim) from past IMPACTSEED teachers about how IMPACTSEED has achieved its core objectives; most notably how IMPACTSEED helped teachers and their students got rid of the fear factor for physics/chemistry to the point where a number of IMPACTSEED students ended up majoring in STEM fields at the university level.

First testimony: IMPACTSEED student sended up pursuing STEM fields in college: (emphasis added)

> My students have been helped tremendously by IMPACTSEED. I often get students who are scared to take high school science classes because they fear they are hard and they won't succeed. They often say they aren't good in math and that they have a strong dislike for both math and science. IMPACTSEED has helped with breaking that thought process and opening the door for student interest and student success. Since IMPACTSEED I have had students who dreaded both Chemistry and Physics. Yet after the first quarter of not only doing well, but firmly understanding the material and being able to apply the math and see how it is used and all comes together, they are hooked. 2 such students went so far as to choose majors in these fields. When you have a program that can take students from dread, lacking confidence in both math and science, and strongly disliking anything math and science...to it being their favorite subject and being success as a college student majoring in the field...you have a program that is worth the time and effort and should be promoted in every school and educational institution. After 16 years of teaching, I have attended MANY teacher workshops

and programs, but NONE have been as successful for students as IMPACTSEED is not only a professional development opportunity and a resource for teachers. It is a game- changer for education. When implementing the concepts and ideas brought out in IMPACTSEED and fully utilizing attention-getting demonstrations that spark interest and close gaps in understanding, children of all ages benefit. IMPACTSEED gives teachers the seeds to plant within their students and the tools to nurture that seed so that students can grow and blossom in their scientific literacy, in their inquiry-based thinking, and in problem solving and high-order thinking. It allows students of all abilities to develop scientific understanding, and even bridges a gap in mathematics. It is a win for student achievement, student confidence, and to the entire field of science. I wish there were more programs like IMPACTSEED and that every student in every area of education could be touched by it

Second Testimony how IMPACTSEED helped teachers gain confidence: (emphasis added)

Because of the networking opportunity provided with IMPACTSEED, I am much more confident in my teaching. It has also introduced me to information and instructional strategies I never saw in high school or college. (Science is an ever-changing field.)

Third Testimony: how IMPACTSEED helped teachers complete her MS degree: (emphasis added)

IMPACTSEED was instrumental in my bid to achieve highly qualified status under the NO CHILD LEFT BEHIND ACT. Offering Courses at the MASTER-LEVEL in physics help me achieve the necessary hours needed in PHYSICS.

Fourth Testimony: how IMPACTSEED helped teachers complete her MS and Ed. S. degree: (emphasis added)

During my time with IMPACTSEED, I have completed both my Master's and my Ed. S. degrees. I have just started working on my National Boards certification in chemistry. In that time, I have also started, and continue to teach, AP Chemistry and AP Biology at our school – the first AP science courses offered in Calhoun County Schools. I currently serve as the AP Coordinator for our school, in addition to teaching.

I have twice been selected as the Teacher of the Year for our school, and I am a Reader (scorer) for the AP Biology exam in the summer

Fifth Testimony: how IMPACTSEED students ended up majoring in STEM fields in college: (emphasis added)

Many of my students have earned academic scholarships to Jacksonville State University, Auburn University, University of Alabama, and others. The students themselves say it is due to their ability to think critically from my classes. I have a student in her first year at the University of Virginia, on a full scholarship, including housing, and she is a science major. I currently have former students majoring in engineering, nursing, pre- med, biology, and chemistry, among other science-related majors.

Sixth Testimony: how IMPACTSEED students ended up majoring in STEM fields in college: (emphasis added)

- full scholarship to Vanderbilt
- full scholarship for high school students for robotics and has transferred to UAH to continue robotics engineering
- full scholarship to UAH - - majoring in chemistry/biomedical
- full scholarship to Loyola --- majoring in chemistry and will master in biochemistry
- Scholarship to Auburn --- possible engineering or physics
- 1 student graduated UAB in biochemical engineering
  1 student received a partial scholarship to UAH for aeronautics (unsure of actual major title)
  2 students are currently undecided majors, but are looking at chemistry or engineering as majors

Seventh Testimony: how IMPACTSEED students ended up majoring in STEM fields in college: (emphasis added)

After attending IMPACTSEED for several years, my skills as a chemistry/ physical science teacher improved. I know this because my student's test scores (ACT) jumped up. As my confidence grew so did my students confidence. I was able to convince some of them to major in science, chemistry even.

4. IMPACTSEED's Budget Summary & Cost Effectiveness

Throughout its 15 years of operation, the bulk of IMPACTSEED's budgets have been spent on resources given to the teachers. Every year, we have identified and acquired a number of technology-based resources -- desktop-type demonstrations kits, teaching modules, chemistry and physics technology devices -- and given them to the teachers at the conclusion of every summer institute and during the Saturday Technology Workshops to take to their classrooms. These resources were utilized by the teachers to enhance their teaching. In this way, IMPACTSEED had direct impact on classroom instruction in participating schools. Additionally, every year we have managed to obtain financial and institutional backing to the project from JSU. These consisted of: (a) cash contributions during every summer institute to pay for the housing of those teachers who were too distant to commute, and (b) cash contributions to hire adjuncts to teach some of the courses of IMPACTSEED's staff who were given release time to concentrate on IMPACTSEED, (c) cash contributions every year to cover for food during the summer institutes and during the Saturday Technology Workshops, (c) unrestricted use of the resources at JSU (physics and chemistry labs, computer labs, classroom space, etc.) to fulfill the agenda of the project.

Figure 2 shows the size of ACHE's funding to IMPACTSEED and JSU's contributions over the course of the last 15 years.

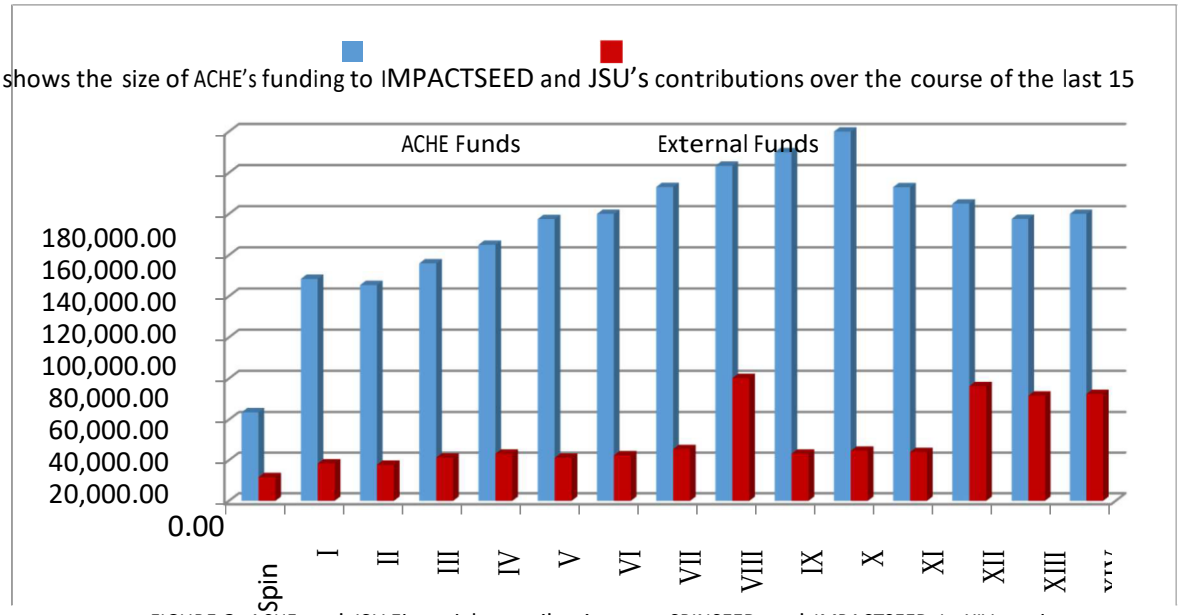


FIGURE 2: ACHE and JSU Financial contributions to SPINSEED and IMPACTSEED I—XIV projects between 2002--2017

5. Concluding Thoughts & Recommendations

In view of the above narrative, we can state with confidence that IMPACTSEED has indeed achieved its various objectives over the course of the last 15 years. Most notably, area students from IMPACTSEED's participating school districts have received high quality instruction in chemistry and physics which is in line with state and national standards. This has enabled a non-negligible number of these students to be accepted into prominent universities and major in STEM fields. We have trained a healthy number of teachers who have become experts and effective in offering high quality instruction in chemistry and physics at the secondary education level. An investment of this magnitude in a large cohort of science teachers will continue to pay dividend for the foreseeable future, until these teachers will reach retirement age and possibly beyond. In fact, we can state with a high degree of certainty that this investment will continue to generate dividend even after the IMPACTSEED cohort has gone into retirement. The reason is simple: IMPACTSEED teachers will end up mentoring their junior colleagues in the various areas they have acquired from IMPACTSEED such as knowledge contents, teaching skills and best practices, pedagogy, and use of technology to deliver an effective education of chemistry and physics at the secondary education level. As such, it becomes self-evident that a long-lasting seed has been planted in the various school districts of northeast Alabama that will continue to bear fruits for the foreseeable future.

Based on the experience acquired over the last 15 years, due to the momentum imparted on the various school districts and the enthusiasm generated among IMPACTSEED teachers, we intend on seeking funding from other organizations, regional as well as national such as the National Science Foundation, to continue offering support to the various school districts throughout Alabama. The task of training critical masses of high school students who end up pursuing careers in STEM fields is inherently long term. it is not something that be done in a limited number of years and then we stop. This a continuous process; this is how one contributes to building a healthy, sustainable scientific and technological base in the US that will sustain a knowledge-based economy.

Physical Science in the 21st Century:

Improving Teacher Quality and Mastery of Content (PS-21)

The University of Alabama

Dr. Dennis Sunal, Project Director

Project Summary (2008 – 2017)

Key Project Objectives

The key project objectives for *Physical Science for the 21st Century: Improving Teacher Quality and Mastery of Content (PS-21)* from 2008 – 2018 have been to provide opportunities for secondary school physical science teachers to

1) acquire and demonstrate greater and deeper 21st century content knowledge on key focus concept themes in the physical sciences found in the national and state standards,
2) acquire, demonstrate, and implement in science classrooms effective instructional pedagogy aimed at facilitating students' meaningful understanding of physical science content,
3) use laboratories and interactive physics approaches in which computer-based graphing, sensors, and related 21st century technology are used to model the conceptual themes.
4) provide professional development of both content and pedagogy during the school year via one-day, face-to-face workshops (institutes) accompanied by online training and resources as a means of acquiring and maintaining participants' practice as highly qualified professionals.

Evolution of Project Concepts and Instructional Strategies

Each year, and over the years, both concepts and instructional strategies taught evolved. The project used its assessments to revise the program and the strategies presented from workshop to workshop and from year to year. In 2008-2009 and 2009-2010, weeklong summer workshops were held followed by two one – day institutes during the year on Saturdays. Teacher feedback indicated limitations occurred preventing them from participating in summer workshops. Examples of such limitations were existing state programs such as the Alabama Reading Initiative, Alabama Science in Motion, and Alabama Mathematics and Science Initiative; all of which required teachers in participating schools to attend two - week summer workshops. At many schools teachers participated in more than one of these initiatives. Teachers requested, instead, four workshops on a Friday or Saturday supported by a website and other online resources. Beginning in 2010, four one - day institutes were initiated to collectively serve as the project workshop. The institutes have had accompanying websites providing resources and opportunities to "Ask-a-Scientist" questions about content. The series of institutes were offered at different high school sites including Hale County High School and Sunshine School. Feedback from the school sites indicated it was very difficult to provide a classroom for a PS-21 institute during the school day and, on Saturdays, the cost involved in having a custodian available and opening and closing a building was more than most school

systems could afford as their budgets were very limited. Eventually, then, PS-21 moved to the University of Alabama's main campus and into its newly built science education suite. The science education suite allowed for materials storage and use by the project and for housing innovative technologies.

Expansion of Focus on Technology

Content addressed in institutes and online discussions changed over time with an accompanying expansion of focus on technologies useful in the classroom and appropriate to physical science content. The content in the field heavily involves mathematics and the use of mathematical modeling to teach concepts and to do physical science investigations (http://modelinginstruction.org/), hence the involvement of Drs. J.W. Harrell, Stan Jones, and eventually of Ranier Schad (Professors of Physics). Pedagogical expertise includes inquiry strategies focused on use of the "science 5E learning cycle" and on "modeling" instructional strategies. Scientific models were presented as *coherent* (Next Generation Science Standards [NGSS]) units of structured knowledge. Modeling methodology engages students collaboratively in making and using models to describe, explain, predict, design, and control physical phenomena. It further involves students in using technology tools for collecting, organizing, analyzing, visualizing, and modeling real data. Student understanding is assessed in more meaningful ways. So, PS-21teachers were encouraged to work collaboratively in action.

By 2010 - 2011, to support an increased application of emerging technologies to teach physical science, we involved Dr. Robert Mayben from 2010 - 2011 through 2014 - 2015 from the state funded Technology in Motion project.

Pedagogy and Mentoring

Overall instructional strategies and classroom pedagogy and curriculum development alignment with national and state standards were overseen throughout by Dr. Dennis Sunal (Professor of Physics Education) and Dr. Cynthia Sunal (Professor of Curriculum and Instruction and Department Head from 2013 - present). To better support application in the classroom, Dr. April Nelms conducted her dissertation research observing teachers at their work to investigate contributions of PS-21's professional development program to expertise in teaching key physical science concepts.

Dr. Cheryl Sundberg served as teacher mentor from 2008 - 2009 through 2013 - 2014. Dr. Donna Turner, a post-doctoral fellow, worked further to mentor participants in 2013 - 2014 and 2014 - 2015. Dr. Melanie Acosta (Assistant Professor, Curriculum and Instruction) worked with teachers in 2015 - 2016 and 2016 - 2017 on strategies to engage diverse students in high needs schools who often may be underrepresented in science courses.

Content Covered in Institutes

The content covered in institutes by the project has addressed the *Alabama Course of Study – Science*, the *SBE Technology Professional Development Standards,* the *National Science Education Standards* (NSES), and later the *Next Generation Science Standards* (NGSS). Specific concepts taught in 2008 – 2009, were the concepts of motion, dynamics, and energy**:** their impact on society, and their essential basis for

understanding science. Assessments used included the *Force Concept Inventory* (FCI), the PS-21 designed *Learning Reflection* and *Assessment of Professional Development*, and the *Reformed Teaching Observation Protocol* (RTOP). Each major concept taught was included in a pre-test administered as the institute began and then re-administered as a post-test at the end of the institute. Project personnel reviewed the pre- and post-tests, performed item analyses, and made conclusions in regard to evident misconceptions revised during the institute as well as those persisting. Following institutes worked further on misconceptions and also addressed additional concepts. A partial example of a pre- and post-test from 2015 is -

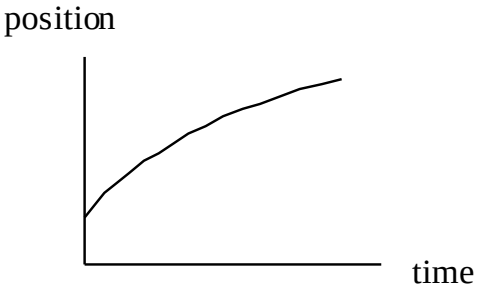
Force and Motion Concept Test

1. A toy car accelerates from rest. The time to go 1 meter from rest is 1 sec. The time to go 2 m from rest is

(a) 2 sec
(b) more than 2 sec
(c) less than 2 sec
(d) not enough information

2. A train car moves along a long straight track. The graph shows the position as a function of time. The graph shows that the train

(a) speeds up all the time
(b) slows down all the time
(c) speeds up part of the time and slows down part of the time
(d) moves as a constant velocity



Using assessment data from 2008 - 2009, further attention was given to the concept of *motion* and force in 2009 - 2010. Participants then explored the concepts of free fall; Newton's 1st, 2nd, and 3rd Laws; Hooke's Law; friction; gravitational and kinetic energy; and elastic and kinetic energy. Based on the data, final decisions on content were made for the next institute during the funding year. When applying for a new year of funding, PS-21 reviewed reported data collected to identify the concepts and themes proposed for the following year. A teacher needs assessment was also conducted in a funding year before the institutes began to obtain teacher feedback on concepts that needed to be addressed. A partial example follows.

Please indicate your level of need for professional development with the following scheduled PS-21 physical science concepts:

1= High; 2= Medium; 3= Low

Below each item indicate your specific need concerning this item.

1. Work and Energy
2. Energy transformation

3. Properties of sound
4. Relevance of the Common Core and Next Generation Science Standards in teaching secondary physical science (further concepts also were listed)

Table 1 describes concepts and themes taught and, as needed, re-taught in following years.

Table 1: ***Concepts and Themes Taught 2008 - 2009 to 2016 - 2017***

Year	Concepts and Themes Taught
2008 - 2009	motion; force, Hooke's law; Newton's first, second, and third laws
2009 - 2010	electricity and magnetism, waves, optics
2010 - 2011	pressure, mechanics, heat
2011 - 2012	energy, electricity and magnetism, modern physics, mechanics, using technology in physical science, and working with other teachers in a professional learning community
2012 - 2013	density, heat capacity, nature of science, structure of atoms using the periodic table, law of conservation of matter, solutions, physical and chemical change, nuclear composition and isotopes, and units
2013 - 2014	reflection, refraction, color, lenses and mirrors, diffraction grating, atomic structure and light, polarization, using technology in physical science, and working with other teachers in a professional learning community
2014 - 2015	relating velocity, acceleration, and kinetic energy to mass, distance, force, and time; measurement of chemical processes; chemical equilibria; electricity and electric fields and circuits; chemical kinetics; characteristics of fundamental forces–gravitational, electromagnetic and nuclear forces; relating the law of conservation of energy to transformations of potential energy, kinetic energy, and heat or thermal energy; characteristics of solutions in terms of components, solubility, concentration, and conductivity; thermal energy and its flow between samples of matter; identifying chemical reactions in terms of evidences and roles of electrons; using common core and *Next Generation Science Standards* with the ALCOS, using technology in physical science; and working with other teachers in a professional learning community
2015 - 2016	analyzing patterns within the periodic table to construct models that illustrate the structure, composition, and characteristics of atoms and simple and complex molecules; motion in one and two dimensions; oscillations and applications; and electric circuits and materials
2016 - 2017	matter and its interactions; forces and interactions; energy; waves and applications; teaching science in high needs secondary schools; using a prior knowledge lesson planning assessment tool – *Diagnoser online teacher resource*
2017 - 2018	velocity and acceleration; kinetic, gravitational, and elastic energy; wave speed, standing waves, Doppler effect; chemical compounds (types and properties); acids and bases and properties of their solutions; chemical bonding (role of electrons; ionic, covalent, and metallic)

The needs assessment also identified technology training needs. The following topics were assessed in 2015 – 2016: Elmo, SMART Board, PhETs, GLX, Logger Pro, DataStudio, relating physics with robotics and engineering, iPad instruction and apps, sponsoring of robotics team, clickers, individual-sized whiteboards w/ graphing lines, simulations, any low cost tech materials, and online assessment tools.

Critical questions for the development of further understanding of each concept and theme were used in the institutes to develop teachers' professional abilities: What is important for the 21st century citizen to know in the physical sciences? What characterizes effective teaching of the focus concept themes? How does one measure the impact of learning the concepts represented by the major focus themes? What do effective lessons look like in the physical sciences?

Assessment of Prior Knowledge

Teachers assessed their own prior knowledge about the focus concepts and themes starting in 2012 - 2013. The project used scenarios such as *Implementing Constructivist Laboratory Experiences in Heat.* Participants in PS-21 asked questions such as "What concepts and sub-concepts are discussed in this scenario?" Why do teachers need to know what students' prior knowledge is (about heat) before beginning to teach?" "How could you take a traditional lesson you teach about heat and make it more constructivist?" "How can you define each critical concept as a learning outcome for your students?" As teachers' focused on identifying their own and their students' prior knowledge, institute activities centered on three questions,
1) "What misconceptions do your students bring to physical science and what should you do about them?"
2) "What engaging explanations and activities can be used in teaching physical science concepts?"
3) "What applications can be used with key physical science concepts to assist transfer to the real world?"
For example, the following common student ideas about the motion of objects were examined and discussed in regard to the first question: What misconceptions do your students bring to physical science and what should you do about them? Some misconceptions were:

- Forces acting on objects are associated with living things
- Constant motion requires constant force
- Speed and distance traveled are proportional to force

Teachers explored and then applied the skills identified by the *Partnership for 21st Century Skills* in their lessons: Learning and Innovation Skills (creativity and innovation, critical thinking and problem-solving, and communication and collaboration skills); Information, Media, and Technology Skills (information literacy, media literacy, ICT literacy); and Life and Career Skills (flexibility and adaptability, initiative and self-direction, productivity and accountability, leadership and responsibility).

Adapting Emerging Technologies

Technology's role in meaningful teaching of physical science concepts was explored by teachers as they were introduced to emerging technologies and investigated how to best use them in the classroom. In the first year, PS-21 built WebQuests for teachers to use with their students and assisted teachers in constructing additional WebQuests. Graphing calculators were introduced along with a website supported teachers' efforts to learn to program graphing calculators and use them in their classes. The website was

initially constructed by project staff then developed further with contributions from teachers and a teacher mentor. It contained a library of resources and lessons; discussion boards; drop boxes for teacher feedback, lessons, and assessments; and a portfolio in which lessons and materials were kept. In later years, wiki sites enabled teachers to build lessons and resources together and to communicate and share ideas and activities with Blogs.

Over the time period of the project, teachers were introduced to varieties of innovative lab approaches, microchemistry activities, and technology applications, simulations and coding, to deepen their own knowledge and for use with their students. These institute activities incorporated a variety of emerging technologies, social media, and measuring key variables using Apps cell phones and IPads. Teachers experienced the technologies and were able to apply them in their own learning as they constructed deeper understandings of physical science concepts and themes. As it became evident that technologies were rapidly changing, Dr. Robert Mayben from Alabama Technology in Motion worked with participants during institutes. He also was available to visit participants' classrooms to assist with individual teacher needs. For teachers outside of the West Alabama in-service region where he worked, Dr. Mayben contacted other Technology in Motion advisors to serve those teachers.

Project staff gradually moved from a focus on the use of graphing calculators, Vernier logger Pro, and Pasco GLX with attached sensors to collect and interpret data to those that could be used with a laptop computer and the Internet. The ability to use laptop computers made data collection and analyses cheaper and simpler since teachers had laptops in their classrooms. Since 2013 the emphasis moved to a focus on IPand and phone applications (apps). Phone apps were becoming more common, were cheap or free, and were being built to address specific physical science concepts and measurements. So, useful apps were identified, taught, and used in the workshops. In 2013, collections of laboratory activities and concept talks on *TeacherTube* and similar electronic venues were assembled and made available. Teachers posted their own videos on such sites as well. Teachers were introduced to the *PhET* interactive simulation and demonstration sites for physical science concepts. By 2014, the possibilities of social media were added to the use of phone apps. Social media were explored, initially with a Facebook site, with a Weebly added next, then with emerging social media venues, as means for engaging students in collection of data across groups and across classrooms. Modeling is fundamental to physical science and to physics. So, the technologies utilized in PS-21 aimed at enabling more accurate and deeper modeling of concepts.

Building on Classroom Observations

In 2012, project staff began visiting participants' classrooms to observe teaching. Dr. April Nelms also collected data then used in her doctoral dissertation to investigate impacts of PS-21 on participants. Project staff co-taught with teachers in their classrooms particularly on highly abstract concepts. The focus was on inquiry teaching and use of inexpensive materials and equipment to teach major concepts. The role of chemistry concepts in physical science was recognized through needs found in classroom observations and Dr. John Vincent from the chemistry department served as part of the senior staff.

Updating and Aligning Content and Instructional Strategies

PS-21 websites were updated in 2014 – 2015 with Alabama CCRS (Common Core) and *Next Generation Science Standards* (NGSS) and links and lesson planning guides connecting the new 2015 Alabama Course of Study in Science (ALCOS-Science) with the new Common Core and NGSS. An emphasis in the institutes was on investigating the physical science themes and interconnections found in the NGSS. Concomitantly, discussion occurred of how to integrate the CCRS into physical science coursework.

By 2015-2016, the online materials made available for PS-21 teachers were extensive and deep. They included useful websites, lesson plans, action research sources, a science education literature bibliography, connections to relevant professional journal articles, and connections to the National Science Teachers Association (NSTA) Science Class. These resources were updated frequently for participant activities between workshops as continuous professional development. Activities were online at **http://ps21.ua.edu** and through a variety of social media.

Collaborative Action Research

Since 2013-2014, teachers have been encouraged to work collaboratively in action research in their classrooms. They considered which instructional strategy best works with a specific concept for their context. So, how do we modify our instructional strategy to best teach kinematics, or motion, or electricity? They considered how we best assess our students' misconceptions, and how those misconceptions are reconstructed into more accurate conceptions. Teachers in different classrooms can collaboratively discuss key aspects of a concept, what strategies will best address those aspects, and test them out. Action research recognizes that it is not generalizable to other settings but can inform us in our own setting. Collaborating teachers, in a diverse and in most cases virtual Professional Learning Community, can work together to identify elements that may be common across settings and also those that are not common. An outline, then, of key elements can be built from collaborative action research.

Throughout the years, PS-21 has taken a crosscutting approach enabling teachers to work with each other and to build collegial support within each school and across schools. In Alabama, many county and city school systems have small student populations. High schools on average have 500 or fewer students. So, physical science teachers have no peers teaching those subjects in their school. PS-21 recognized this teacher isolation and used websites with discussion boards and later, social media, to offer teachers opportunities to engage with other physical science and physics teachers across school districts around the state. The project has offered opportunities for in-service teachers to work with colleagues and experts developing their content knowledge base and more focused technology-based teaching strategies in physical science and the associated disciplines of physics and chemistry.

The University-School Partnership For Secondary Science (BioTeach)

University of Alabama at Birmingham
Center for Community OutReach Development (CORD)

Dr. J. Michael Wyss, Project Director

Project Summary (2004 – 2017)

I. Overview of the University School Partnership for Secondary Science

In 1998, the University of Alabama at Birmingham (UAB) initiated the University School Partnership for Secondary Science, which combined two developing programs for Teacher Professional Learning (TPL). BioTeach was a major TPL for summer training of high school (HS) biology teachers throughout the state, and GENEius was a student-teacher learning laboratory in which teachers could practice the inquiry-based science that they learned in BioTeach. This unified program has been funded since 1998 by Alabama Commission on Higher Education's (ACHE) No Child Left Behind (NCLB) funding. Both programs have evolved over the 19 years of ACHE funding and currently serve 450+ BioTeach graduates and about 2,000 of their students in GENEius, and about 45,000 students are taught by graduates yearly.

II. The BioTeach Program

BioTeach was developed in 1992 by UAB Neuroscientist, Dr. Terry Hickey and Biochemist, Dr. Steve Hajduk to meet the increasing need for HS teachers to understand modern molecular biology. It has offered state-of-the-art inquiry based experiences that assisted teachers in understanding science principles and how to convey those to their students. Since then, UAB Science, Technology, Engineering, and Mathematics (STEM) faculty and area school science teachers and administrators have partnered in developing BioTeach to provide teachers with state-of-the-art knowledge and skills. BioTeach has enabled teachers to greatly enhance student education in the classroom, and in UAB's Center for Community OutReach Development's (CORD) GENEius labs and Summer Science Institute. BioTeach has also recently included upper level middle school (MS) teachers and has graduates serving in over 34 school districts in Alabama and in schools from New York to Hawaii.

The goal of BioTeach has been to provide teachers with the basic knowledge and laboratory resources needed to make molecular biology understandable and engaging to secondary students in Alabama's schools. BioTeach has been offered as a graduate level course that allows participants to take up to 6 graduate school credit hours. BioTeach has been taught at the McWane Science Center in the GENEius Lab through a successful collaboration between UAB CORD and the McWane Science Center. In this format, BioTeach has provided teachers with the unique opportunity to learn from funded research

experts about the latest discoveries in research and to learn how to bring the excitement of science to their students in the classroom.

III. Objectives of the BioTeach Program

1. Increase biology teachers' subject matter knowledge in Biochemistry, Cellular, Micro and Molecular Biology, Genetics and Neurobiology.
2. Build a professional learning community comprised of UAB scientists and local HS teachers and administrators to infuse state-of-the-art science into classrooms.
3. Prepare BioTeach graduates to facilitate the GENEius experience for their students.
4. Make high technology laboratory experiences available to students so that they are competitive with the best science students in the world.

Support from ACHE allowed BioTeach to make important revisions to the course, including formal classroom implementation sessions and follow-up workshops during the academic year by Dr. Robert Akscyn, Dr. Patrice L. Capers, Jill Chambers, Kevin Jarrett, Sandra McKell, other CORD personnel, and UAB-Alabama Math, Science, and Technology Initiative (AMSTI).

IV. Implementation of the BioTeach Program

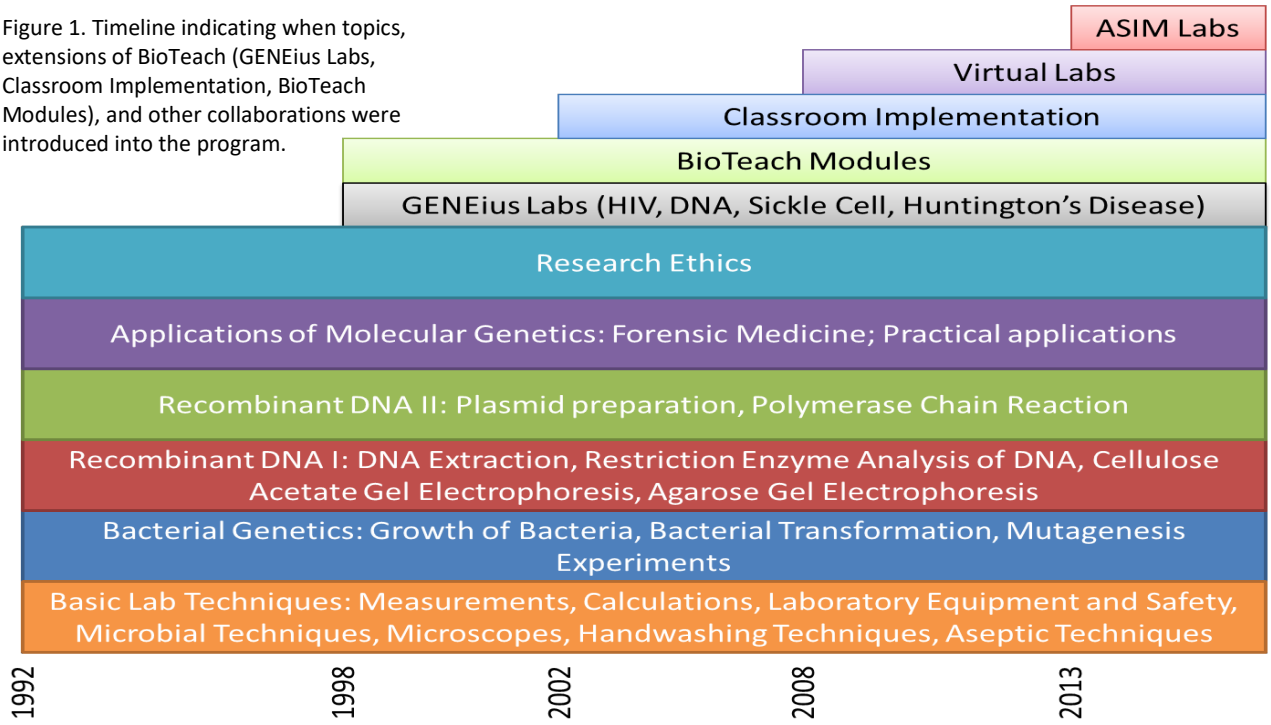
The BioTeach staff, including undergraduate and graduate students, master teachers, postdoctoral fellows and CORD personnel have continued to stay abreast of new technologies, resources, and strategies to bring molecular biology to the classroom. BioTeach has collaborated with UAB's School of Education to recruit teachers, create assessment instruments, and develop modules. Daily sessions in BioTeach typically began with a 2-hour presentation from a prominent UAB scientist. Lectures contained original data generated from the speakers' funded research and a broader summarization of their field and recent advances made. Scientists were generally selected to present on days where their lecture coincided with a related inquiry-based experiment. These biology experiments included activities such as bacterial genetics, polymerase chain reaction (PCR), and forensic analysis. BioTeach staff was crucial to helping participants work in small groups (team science). This approach of experiments following lectures, helped teachers understand how basic scientific knowledge is 1) used in the laboratory and 2) can lead to major medical discoveries. Teachers were encouraged to ask questions about the experiments since many served as building blocks for subsequent exercises. This allowed the opportunity for BioTeach staff to clarify any misconceptions.

Experiments required critical thinking and enhanced teacher's biotechnology skills. Originally implemented as a 5-week course, BioTeach changed to a 3 week course. The first week was generally devoted to learning basic skills (e.g. measurements, pipetting, and bacterial culture). The second and third weeks allowed teachers to become proficient in sophisticated techniques such as gene cloning, deoxyribonucleic acid (DNA) isolation, DNA and protein gel electrophoresis, PCR, and restriction

endonuclease analysis. This was made possible through the integration of the GENEius/Lab Works laboratories, BioTeach modules, and Alabama Science in Motion (ASIM) modules, all of which were all available to the BioTeach graduates and their students during the academic year. The classroom implementation portion of BioTeach helped teachers teach concepts using hand-on activities versus lecture alone.

Due to the diverse background and interests of BioTeach participants each year, we attempted to incorporate their interests in our selection of speakers and inquiry-based activities while continuing to teach core concepts. Since inception, we have focused on 5 areas (Figure 1). Each year based on feedback we have added or removed topics within these areas which have included (partial list): X-Philes, Cancer, Infectious Diseases, Crystals in Space, Anthrax, Hypertension, Anatomy and Physiology, and Drosophila. Participant's interests were also used to help us create, use, and revise GENEius Labs and BioTeach Modules.

Figure 1. Timeline indicating when topics, extensions of BioTeach (GENEius Labs, Classroom Implementation, BioTeach Modules), and other collaborations were introduced into the program.



V. GENEius Labs/Lab Works/BioTeach Modules

The GENEius program has offered teachers a chance to gain further TPL by one of CORD's researchers/educators teaching a state-of-the-art lab. Teachers then assisted in teaching the lab to the students that they bring to the day long experience to engage them in challenging experiments exploring molecular biology and genetics. The availability of the cutting edge technology allowed teachers to challenge their students with very complex hands-on experiments that were typically not encountered even in many college biology courses. The GENEius lab (HS version)/Lab Works (MS version) gained increasing participation with nearly 3,000 participants each year (over 100 classes including teachers outside of BioTeach) with most teachers returning annually. GENEius offered four labs covering the topics of sickle cell anemia, DNA fingerprinting, Huntington's disease and human immunodeficiency virus (HIV). In "***Sickle Cell Anemia: Tracking an Inherited Trait***" students employed restriction endonuclease digestion, cellulose acetate gel electrophoresis and agarose gel electrophoresis to discover which of three putative patients had the sickle cell genotype/phenotype, using DNA.

Microscopy was used to view red blood cell phenotypes of blood samples from wild type and transgenic sickle cell mice. The inquiry-based, problem-solving approach facilitated students' understanding of the basic concepts of genetics, cellular and molecular biology and provided experience with contemporary tools ofbiotechnology. It also led to students' appreciation of the causes and consequences of this genetic disease, thus increasing their understanding of the first principles of genetics.

Figure 2. The results of a successful gel electrophoresis experiment.

In "***DNA: A Person's Ultimate Fingerprint***" students focused on genetic diversity and use contemporary techniques of molecular biology to isolate DNA from their cheek cells, using PCR to amplify a highly variable region of chromosome 1, and employing gel electrophoresis to analyze DNA samples of the D1S80 gene. Students then quantified their inherited copies of D1S80.

Figure 3. BioTeach participants set up the gel electrophoresis apparatus.

In "***HIV Attack: Lifecycle of a Virus***" students explored the lifecycle of HIV and tested the presence of the antigen by utilizing an Enzyme Linked Immunosorbent Assay. Public health issues relating to acquired immune deficiency syndrome (AIDS) epidemiology and HIV transmission were also addressed through class discussion and a mock fluid exchange.

Figure 4. BioTeach participants detected the presence of HIV in body fluids of unknown samples.

The "***Huntington's Disease: The Trembling Brain***" lab focused on both normal and diseased states, students dissected a sheep brain and traced neuronal sensory pathways. Students used agarose gels and semi-log graphs to identify pathological DNA samples of a mock family. Ethical issues surrounding genetic testing were also discussed.

In addition to the in-house laboratory experience, BioTeach also offered three fully stocked modules designed to be used for several days in the classroom. Modules came with all the equipment, supplies and reagents students needed to perform inquiry-based experiments in microbiology and molecular biology. This provided access to state-of-the-art equipment and experiments that they may not have had access to otherwise.

The "***Measurement and Growth: An Introduction to Molecular Techniques***" module introduced students to basic molecular and microbial techniques. Students learned how to use modern equipment, grow *E.coli* on plates and in liquid media, use the scientific method, and design experiments. Specifically, they learned how to streak for single bacterial colonies on agar plates. They then measured the growth rates of different strains of bacteria under various environmental conditions. The students also swabbed their environment for microorganisms and design experiments to study the effect of "nonstandard" conditions on bacterial growth.

The second module, "***Ultraviolet Mutagenesis***" allowed students to generate ultraviolet (UV) dose response curves for two strains of *E.coli*. They also examined the effectiveness of various sun blocking agents. Students then designed their own experiments using UV sensitive and UV resistant bacteria, a UV light source and various UV blocking agents. This module was excellent for allowing teachers to introduce the scientific method and experimental design.

Figure 5. BioTeach participants streaking agar plates.

The last module, "***DNA-Mediated Transformation of Bacteria***" proved that DNA is the genetic material for all organisms. By treating *E.coli* with a cold Calcium Chloride solution and exposing *E.coli* to a plasmid containing pGLO (a gene for green fluorescent protein), students could transform the genome of *E.coli*. Next, they selectively grew cells on plates containing ampicillin and arabinose and successful transformation was noted when the use of UV light irradiated plates. This module

reinforced the fundamentals of experimental design. Other modules created and used include "***Gram Staining Microscopy***" and "***Detection of Genetically Modified Crops***". After the completion of BioTeach, ~75% of graduates brought their classes to the GENEius laboratory and requested BioTeach Modules for their classrooms.

VI. The Alabama Science in Motion (ASIM) Connection

From 2013-2017 ASIM has been incorporated into BioTeach with the collaboration of Jill Chambers, the ASIM Biology specialists. Through this collaboration we were able to introduce ASIM modules to the teachers as "qualified" ASIM TPL. It also served as a vertical/horizontal alignment tool by helping MS and non-biology teachers become aware of the educational resources that their students would receive in advanced biology courses. At least five sessions were devoted to Alabama Course of Study Science Standards and modules to help teachers implement the new science standards.

Figure 6. BioTeach participants using the ASIM module to build 3-D DNA. models.

VII. Classroom Implementation

Classroom implementation strategies were also a critical part of ensuring the ability of participants to teach concepts learned in BioTeach regardless of access to equipment. Mrs. McKell was a great asset to BioTeach, as a past participant and master teacher she was able to help the teachers with inquiry-based experiences for classroom implementation.

Figure 7. Simulated DNA Analysis Activity

Figure 8. BioTeach participants displayed their plasmids and described the enzyme used to cut DNA.

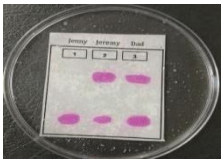


Figure 9. Simulated Gel Electrophoresis Activity

VIII. BioTeach Professional Development Workshops

After the completion of the summer course, BioTeach participants returned for three professional development training sessions during the academic year. These workshops provided the opportunity for teachers to get technical assistance in any of the modules that theyplanned to use in their classes, discuss the details of implementation with scientists and fellowteachers, and share experiences with the goal of improving science education for students.

Figure 11. ASIM/BioTeach participants completing ASIM module on cladograms.

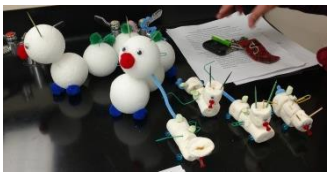


Figure 12. Reebops created as an activity to discuss genetics and Mendel's Laws.

Figure 13. Results of simulated DNA-based diagnostic test for cancer-causing mutation.

IX. Demonstration of Content Mastery

As a part of the BioTeach program, teachers were required to work in groups to create lesson plans for the classroom implementation of several molecular biology topics with accompanying experiments. Lesson plans and activities were presented to the entire group at the end of BioTeach where they received constructive feedback. Presentations included PowerPoints, handouts, assessments, and a formal lesson plan. The HS lesson plans were all modifiable for use in MS. At the end of the course all participants received electronic or hard-copies of all lesson plans presented to help them incorporate lessons into their classrooms. Speakers and other staff were invited to attend presentations to see the outcomes of the course which helped create a stellar reputation for BioTeach.

This reputation allowed us to recruit over 70 top world-class researchers who eagerly volunteered to give lectures.

Figure 14. BioTeach participants presenting their lesson plan.

X. BioTeach Speakers

The lecturers, who freely provided lectures year after year, included faculty members, postdoctoral fellows, and graduate students from over 11 departments within UAB (School of: Dentistry, Education, Health Professions, Medicine, Natural Science and Mathematics, Optometry, Public Health, Social and Behavioral Sciences) and included a few individuals from outside institutions. The speakers included department chairs, two Presidents of national science societies and both mature and newly minted scientists.

Over the years, 15 speakers have presented consistently for 5+ years, indicating the appreciation of BioTeach and the teachers. Most speakers also volunteered to assist teachers both at distance (by phone and internet communications) and via visiting their classrooms to assist students in their understanding of scientific concepts.

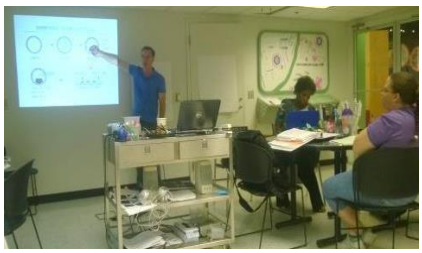


Figure 15. Dr. Detloff lecuring

XI. BioTeach Participants (Teachers)

The majority of all BioTeach classes had a mix of new and veteran teachers with a range of certificates and degrees. This mixture provided excellent dialogues and exchanges within the group regarding the type of science foundation needed at the MS level to support a HS curriculum and what students entering HS should know. The courses taught by our teachers also varied and included: Biology (pre-AP/AP/IB), Life Science, Chemistry (IB/AP), Physics, Zoology, Forensics, Environmental Science, Botany, Physics and Anatomy & Physiology.

The majority of all BioTeach classes had a mix of new and veteran teachers with a range of certificates and degrees. This mixture provided excellent dialogues and exchanges within the group regarding the type of science foundation needed at the MS level to support a HS curriculum and what students entering HS should know. The courses taught by our teachers also varied and included: Biology (pre-AP/AP/IB), Life Science, Chemistry (IB/AP), Physics, Zoology, Forensics, Environmental Science, Botany, Physics and Anatomy & Physiology.

While BioTeach focused on underserved schools, we allowed pre-service teachers and private school teachers to participate. This provided a unique opportunity to expose these teachers to some experiments that teachers have access to (ASIM kits) that they could customize for their class. Classroom implementation also revealed practical ways to incorporate topics and techniques learned in BioTeach into their classroom in an inexpensive way.

XII. Evaluations of the BioTeach Program

We have surveyed BioTeach graduates to guide the improvement of the BioTeach experience. Pre and Post Tests were also collected on 1) self-efficacy teaching and knowledge, 2) science content knowledge, 3) gains in science content knowledge, 4) changes in attitudes and classroom teaching methods, 5) perception on the usefulness of experiments and ability or interest in incorporating experiment in the classroom, 6) satisfaction with BioTeach, and 7) suggestions to improve BioTeach (topics, speakers, experiments, etc.). Based on responses from surveys the majority of participants gained much more than initially expected and noted that their students would also benefit from their increased knowledge. Expert speakers, facilitators, and program directors were also evaluated each year to improve program quality.

In a survey of past participants in 2013, 75% of the 192 responding graduates said that they continued to use the material and pedagogy received in BioTeach in their classrooms. Of these same participants, ≥ 50% said they use inquiry-based experiences they developed in BioTeach.

XIII. Impact of the Partnership

Based on the success of the Partnership, CORD applied for and received grants totaling $7.5M from NSF, NIH USDEd and the ALSDE. In addition, we are proud of the outstanding education leaders CORD has developed. Previous Directors of the Partnership-BioTeach- GENEius include: Ryan Reardon (former director A+ College Ready, now head of Science at Jefferson County International Baccalaureate School), Mary Williams (science teacher at the Altamont School), Eric Blackwell (Professor and Outreach Director, Delta State Univ.), Sabrina Walthall (Professor and OutReach Director at Emory University), Vanessa Williams (Science OutreachDirector Georgia State University), Laura Cotlin (Prof. UAB) and Michael Miller (University of Chicago).

We have opened up similar science education programs in Dallas County, Selma and Tuskegee, and those programs continue to perform well

Summer Intitute at Selma where teachers piloted BioTeach Express.

Statement on Impact of BioTeach from Sandra McKell (BioTeach grad/Master Teacher):

"BioTeach in 1997 provided the spark I needed to ignite not only renewed interest in my teaching, but it also kindled excitement for student learning. Prior to BioTeach, I had not used micropipettes or had any experience with gel electrophoresis or PCR. I was eager to use biotechnology equipment and thrilled to add the latest biotechnology component to my classroom. I learned a great deal from the "hands on"component, as well as, the lectures from visiting UAB professors. Because of BioTeach, I know I became a better teacher and my students became more competent learners. It was also a bonus knowing that the CORD staff was only a phone call away. Over the years I have collaborated with BioTeach each summer, primarily providing teachers with methods of classroom implementation."

The ACE (Alabama Classroom Enhancement) – STAR (Success Through Academic Research) Project: An Independent Study Scholarship Program

University of Alabama in Huntsville

Dr. John Pottenger / Dr. Andrea Word, Project Directors

Project Summary (1999 – 2017)

This document reports on the design and impact of a federally-funded, ACHE-sponsored project administered at The University of Alabama in Huntsville (UAH) from 1999-2017. The independent study project was administered first as *The Alabama Classroom Enhancement (ACE) Project: The Independent Study Scholarship Program* (1999-2003) and subsequently as its successor, *The Success Through Academic Research (STAR) Project: The Independent Study Scholarship Program* (2004-2017).

The primary objectives for the project were (a) to improve teacher knowledge of core academic subjects and (b) to align with the Standards of Effective Professional Development adopted by the Alabama State Board of Education. With the reauthorization of the Elementary and Secondary Education Act (ESEA) as No Child Left Behind (NCLB) in 2001, a third objective was added: to partner with high-need school districts across the state as well as education units at the university. In the sections below, the project background and design are presented, followed by a discussion of the impact of the project on the lives of teacher-scholars and their students statewide.

Background: The ACE-STAR Project

The program began in 1999 as *The Alabama Classroom Enhancement (ACE) Project: The Independent Study Scholarship Program* with an ACHE grant funded by the federal Dwight D. Eisenhower Professional Development Program (later, the federal Preparing, Training, and Recruiting High Quality Teachers and Principals Program under NCLB). This grant, awarded to the Office of International Programs and Services (OIPS) at UAH, funded the administration of a scholarship program for meritorious teachers (K-12) in the state of Alabama. Subsequently, the OIPS (and later the UAH Intensive Language and Culture Program (ILC) and College of Education) received 17 iterations of the ACHE-sponsored professional development grants. These grants allowed the project to provide teachers with the opportunity to design an independent study program to enhance both their content knowledge and their teaching practice, following best practices in professional development standards.

In 2001 with the reauthorization of the Elementary/Secondary Education Act (ESEA) as No Child Left Behind (NCLB), professional development programs like ACE were required to include partnerships with university education units as well as a "high-need" school system. Therefore, in 2003, ACE was renamed *The Success Through Academic Research (STAR) Project: The Independent Study Scholarship Program.* Hereafter, in this review the two projects will be referred to jointly as the ACE-STAR project. In 2014, project administration

shifted from the OIPS to the UAH ILC and then, in 2016, to the UAH College of Education. Therefore, for the sake of consistency and clarity, the OIPS will be referenced in description of the initial design and administrative oversight of the projects. Thereafter, the phrase "project personnel" or "project" (a combined reference to the OIPS, ILC, and College of Education) will be used in reference to administration of the program across multiple periods.

The ACE-STAR Vision

The vision of the ACE-STAR project presented in the original and subsequent proposals encouraged Alabama teachers to submit applications for scholarships to engage in independent study in any of the nine (later ten) core subject areas of arts, civics and government, economics, English, foreign languages, geography, history, mathematics, and science. In 2003, ACHE added another subject identified as a core area under NCLB: reading or language arts. Selected teachers were awarded a scholarship to engage in independent study consisting of advanced training in classroom subject content, including training in classroom teaching techniques. The award of an ACE-STAR scholarship thus enabled the teacher to design his or her own research study, or to select a professional workshop or other activity to attend.

To support the twin objectives on increased content knowledge and adherence to best practices in professional development, the ACE-STAR project incorporated a distinctive design including: the search for ACE-STAR scholars among Alabama's teachers, the careful evaluation of applicants and selection of scholars, a colleague-mentor model to support scholars in applying lessons learned from their research back into their classrooms, meaningful follow-up programs for the scholars, and evaluation data of the ACE-STAR project for purposes of quality assessment and improvement.

The Statewide Search for Scholars

To insure long-term impact and growth for teachers whose career stage would align with independent study of this nature, only those teachers who had completed at least three years of full-time teaching, who were under contract to teach in the following academic year, and who were at least five years away from retirement were eligible for consideration. During the early years, project personnel solicited nominations of teachers from superintendents and principals statewide. Beginning in 2003, pursuant to ACHE's revised guidelines, project personnel partnered with the UAH Department of Education (now College of Education), the UAH College of Liberal Arts (now Arts, Humanities, and Social Sciences), the UAH Institute for Science Education, and one or more high-need school districts or local educational agencies (LEAs).

Across the years, school district administrators were asked to nominate teachers who would benefit from an independent study project, who would be sufficiently motivated to design such a project, and who would submit a proposal for consideration. In the most recent years of the project, nominations were accepted from teachers statewide. However, all other variables held equal, nominations from the high-need LEA partner each year were given preference. As a result, teachers selected for ACE-STAR scholarships across the years represented school systems across the state with a meaningful group of scholars selected from high-need districts.

The Selection of Teacher-Scholars

Each year, the ACE-STAR project personnel evaluated the quality of the proposals and then selected the most deserving applicants as scholars. In order to accomplish this task, the project director and assistant director read each proposal for potential suitability of substantive content according to the procedural guidelines approved by ACHE. Core subject specialists were recruited from the teaching and research faculty and staff of UAH across from diverse academic disciplines within liberal arts, science, and technology. In their evaluations, these specialists provided written comments and assigned a numerical rating to the following categories: description of proposed program of study, likely benefit of the proposed study plan to the applicant's intellectual growth, the proposed study plan's likely benefit to the applicant's classroom effectiveness, and the proposed study plan's effectiveness in addressing the particular core subject area needs in the applicant's school or community. Since 1999, over 50 academic specialists have reviewed one or more applications for an ACE-STAR scholarship.

After receiving the specialists' evaluations with their comments and numerical rankings, a final selection committee was convened to discuss the merits of each application and award scholarships to those found to be meritorious. The selection committee consisted primarily of directors, chairs, and faculty representing various academic programs and honors organizations as well as a wide range of academic interests and international experiences. From UAH or the local education community, twelve recognized scholars and educators have served at least once on each year's final selection committee. From 1999 through 2017, of the over 300 teachers who submitted an application, 168 (56%) were awarded an ACE-STAR scholarship. Of the 168 teachers awarded a scholarship, 66 recipients (40%) taught in high-need schools.

Scope of Content and Location

The teachers engaged in study within one of the ten core subject areas of arts, civics and government, economics, English, foreign languages, geography, history, mathematics, reading or language arts, and science across all grades (see Appendix D). While prospective applicants were encouraged to design their own independent study project, many applicants chose to incorporate into their study plans a specialized workshop or other professional activity designed specifically for teachers. As a result, the 168 teachers awarded an ACE or STAR scholarship engaged in a wide array of independent study projects, from studying Italian art to investigating biological characteristics of rainforests.

In the review process, preference was given to those meritorious applications outlining plans for out-of-state or study abroad programs. As a result, over 60% of the scholarly projects approved for support were conducted in one or more nations of Europe, Central and South America, North America (excluding the United States), the South Pacific, Africa, and Asia. In all, the international projects were conducted in over 30 countries, with some teachers studying in more than one location or country during their projects.

Impact in the Classroom and Beyond

A compelling feature of the program design was the requirement that scholars, in consultation with their principals, identify a mentor who would serve as a sounding board and consultant to the recipient. Upon the recipient's return from his or her independent study project, the mentor provided support and assistance to the recipient as he or she attempted to enhance his or her classroom teaching as a result of the independent

study experience. Each mentor was offered a nominal stipend and, in some years, the book *The Mentor's Guide* (Lois J. Zachary, 2000) to assist in effective mentoring. Since 1999, over 130 individuals have served as mentors for one or more of the ACE-STAR scholarship recipients.

Most mentors were colleagues with extensive experience in teaching and/or administrative roles in Alabama schools. As a result, the impact of the program extended beyond the individual scholarship recipient's increased content knowledge and innovations in teaching. In their end-of-year reports, mentors consistently commented on the positive impact that the mentorship, itself, had on their thoughts about teaching and their own practice. Impact on professional relationships extended, as well, beyond the mentor/scholar partnerships, as ACE- STAR scholars often reported back on their experiences and innovations to colleagues at their schools and, in some cases, across their districts and beyond – at professional conferences.

Of the 168 scholars funded through the ACE-STAR program, 66 (40%) were located in high-need school districts across Alabama. As a result, students in those districts received direct immediate benefit from the teachers' experiences, through engagement in innovative teaching that ranged from the creation of community gardens to replication of the Parthenon and 3D printing of Roman structures. Student products resulting from ACE-STAR teacher innovations have been featured in museum and community displays around the state, and student response to teacher stories and artifacts from their travels has been overwhelmingly positive across the years of the ACE-STAR project. Students, who may never have been outside their own community or their local region, expressed growing interest in travel beyond the borders of Alabama – beyond the United States – to pursue their own passions around the world.

Follow-up Program: Recognizing Achievement

In order to recognize the scholars' achievements, to provide a venue for professional engagement outside their own schools and locales, to honor the efforts of both scholars and mentors, and to provide an opportunity to learn more about impact on student engagement, a follow-up program was held in late spring of each academic year in which the scholars had conducted their projects. Using PowerPoint presentations, videos, photographs, Prezis, and artifacts of their independent study experiences, each scholar presented on the nature of his or her project and the effect of incorporating the findings in classroom instruction. The scholars also displayed other relevant items on a separate table for viewing during the follow-up program. Each scholar and mentor later submitted a year-end report that discussed the independent study project, classroom application, and mentorship activities.

In addition to the presentations, each follow-up program included a welcoming orientation, program evaluations, lunch, often and a special cultural event, such as a museum tour or other activity. Finally, across several years of the project, a guest speaker capped the day with a unique motivational presentation or workshop. Invitees to attend the presentations included ACHE and other state education officials, senior administrators at the university, as well as students in Education at the undergraduate and graduate levels, who benefitted tremendously in the opportunity both to see and hear discussions of the scholars' experiences and teaching application and also to have the opportunity to discuss with the scholars and mentors how such professional development activities served as a source of support and inspiration in their own teaching.

In Their Own Words: Teacher, Mentor and Evaluator Insights

To add greater dimension to this historical report of the impact of the ACE-STAR project relevant data of all project files from 1999 through 2017 was reviewed. In addition, contact information was sought for all of the ACE-STAR scholars. Of the 168 recipients, 148 could be reached. Of those 148 recipients, 92 responded to comprehensive questionnaires seeking their thoughts on the impact of the ACE-STAR project on their professional growth and careers.

The questionnaire items were designed to probe the extent to which the ACE-STAR experience led the recipients to pursue further opportunities and continue to build on the professional development success they had experienced under the project. The questionnaire also sought to determine the impact the ACE-STAR independent study projects had on classroom performance as well as on the general professional lives of the scholarship recipients.

Many respondents indicated that the award of an ACE or STAR scholarship had increased their confidence in the ability to secure another scholarship. The empirical data from the questionnaires reveal that 53 (58%) of the respondents went on to apply for other scholarships. Moreover, 44 (83%) of those who applied to other scholarship programs were awarded a scholarship. With regard to the professional development of their colleagues, 87 (95%) of the respondents indicated that they shared their ACE-STAR independent study project with their principals, colleagues, or other groups, and when asked if they had recommended the ACE-STAR independent study scholarship program to others, 88 (96%) indicated that they had done so.

In annual reports, scholars and mentors submitted written evaluations of their experiences each year. Virtually every mentor noted that the ACE-STAR scholars brought their studies into their classrooms and shared their findings with colleagues to the benefit of entire departments. For example, one mentor, who is also the school principal, reported, “We have done school wide units on other countries but never Italy. The students experienced a new culture and gained knowledge of the many aspects Italy has to offer. New ideas included opera, cuisine, language, and the study of Galileo, Pompeii, and other topics. . . . The students gained knowledge of the following: dance, opera, art, language, geography, science, social studies, and history. . . . [T]his independent study allowed the Italy team [of STAR scholarship recipients] to accomplish this objective.” When asked if the STAR scholarship recipient benefited from her independent study program in China, another mentor responded, “Definitely! … Her Asian experience has not only improved the quality of her teaching, but has provided opportunities of learning for her students that they would not have experienced otherwise. Her enthusiasm has piqued the interest of her students, parents, colleagues, and the community about Asian culture… Isn’t that exciting how the adventures of one person can enlighten a community!”

In addition to evaluation by the mentors, an external evaluator regularly assessed the quality and effectiveness of the ACE-STAR project. External evaluations addressed the impact of each teacher’s independent study program on the teacher’s enhancement of his or her academic expertise, the extent to which transfer of knowledge and insight from the independent study program to the teacher and from the teacher to the classroom has resulted in improved teaching effectiveness and student learning, and the effectiveness of the OIPS specifically in administering the projects.

In her comprehensive and detailed reports, which can be found in each year's Director's Report submitted to ACHE, the external evaluators relied on qualitative and quantitative evidence to review the ACE-STAR projects and render assessments. Evaluator assessments of the evidence continually indicated that the administration of the independent scholarship programs was highly successful and that teachers had benefited greatly from their experiences. Indeed, responses to the evaluation survey indicated that the scholarship recipients consistently rated the ACE-STAR projects very highly in nearly all aspects of execution, from personal development in content knowledge to enhancement of classroom teaching.

The Bottom Line

Across the 18 years of funding that totaled $1,288,849, the ACE-STAR project supported 168 teacher-scholars representing 10 content areas (see Appendix D). During the years this data was gathered (2009-2017), ACE-STAR scholars taught more than 18,000 students across the state. A conservative number across the entire life of the project would put the number of students served at 33,000. The impact, of course, is exponentially larger, given that scholars were experienced teachers who continued teaching well beyond the year of their award.

In the later years, the focus on partnering with high-need districts meant that 66 scholars were from school systems in which students were unlikely to move beyond the immediate region. As a result, because the majority of scholars conducted their research outside the United States, these children were touched not only by innovative teaching practices but also by exposure to the world as a locus for learning.

The ACE-STAR project provided opportunities for teachers to design experiences through which they could hone their professional skills. The results led not only to improved professional practice but also to increased motivation and skills that led these individuals to pursue additional funding and development opportunities across the years. In short, the relatively small financial investment in federal funding created a cohort of teacher-scholars whose professional knowledge and practice was enhanced – and whose students were forever changed in terms of how they engaged with the content in the classrooms and how they viewed the world itself as a place of learning.

Wiregrass Math, Science, and Technology Leadership Academy

Troy University-Dothan Campus

Dr. Vijaya Gompa, Project Director
Dr. Shawn Plash, Project Director (2016-2017)

Project Summary (2011 – 2017)

1 Introduction

The Wiregrass Math, Science, and Technology Leadership Academy (WMSTLA) has been funded by Alabama Commission on Higher Education (ACHE) through NCLB grant from 20111 through 2017. Wiregrass Math Science Technology and leadership academy provided quality professional development for Wiregrass area Elementary Science and Middle School Math teachers. Improving teacher quality had been a high priority for the Academy. Each year, WMSTLA invited applications from teachers during the months of April-May, offered four to five-day summer institutes during June, one follow-up workshop during November and another follow-up workshop during February or March for the approved teachers. The participants received variety of science, math and technology themed teacher workshops from nationally known scholars with free breakfast and refreshments (provided by Troy University) during the workshops.

The Wiregrass Math and Science Consortium (WMSC) was established in 2001 as a collaborative project between Troy State University- Dothan (currently, Troy University-Dothan Campus), NASA Marshall Space Flight Center in Huntsville (Alabama), and partner school systems in Southeast Alabama. WMSC main focus was to utilize aerospace education to improve teacher effectiveness and, consequently, increase student performance in Math and Science in K-12 schools. ACHE funded WMSC through Eisenhower grant during 2002-2003 and later through NCLB grant until 2008. WMSC provided professional development for K-8 teachers in inquiry-based math and science instruction and workshops emphasizing technology and teaching from 2001 to 2008. Each year, WMSC invited applications from teachers during the months of April-May, offered 2 to 5-day summer institutes during June-July; 2 to 5 follow-up workshops November through March (at most one workshop in a month). For example, 3 follow-up workshops (November, February, March) in 2006; three-day summer institute (June 28, July 13-14) and 4 follow-up workshops (September 21, October 24, November 17, February 9) during 2006-2007. Troy University had gone through major changes and reorganization during the period of WMSC project.

[1] Throughout this document, we use years in reference to a grant to indicate the beginning of the funding year.

2 Project Goals and Objectives

The goals and objectives of the Wiregrass Math, Science, and Technology Leadership Academy were specifically aligned with the Alabama Course of Study for Math and Science and supported the State Board of Education's (SBE) Twelve Standards for Effective Professional Development.

Goal I: Provide Alabama K-12 teachers with high quality, long-term, sustained professional development opportunities (SBE Standards: 1, 2, 3, 4, 5, 7, 8, 9 and 11).

Objectives:

I–A. The teacher participants will be exposed to approximately 40-50 hours of professional development on campus and in other appropriate sites in the area.

I–B. Teachers will be given opportunities to share best practices for meeting curriculum standards in a variety of activities from nationally known presenters.

I–C. Sustainability will be accomplished by continual activities and communication, both online and in person.

I–D. Professional learning communities will become established in high-need systems, one of the guidelines for innovative educators according to the Educate Alabama information.

I–E. The Academy will make resource materials available to all teachers in the surrounding area.

I–F. Information will also be made available to teachers statewide through publication by newsletters, websites, and other available media.

Goal II: Provide teachers with subject matter knowledge and instructional techniques designed to enhance student learning (SBE Standards: 7, 8, 10, and 11).

Objectives:

II-A. Participating teachers will receive instruction in inquiry-based math and science teaching concepts, such as physical and natural sciences for elementary teachers and math concepts for middle school teachers.

II-B. Teachers will attend workshop sessions that focus on the effective use of technology, with special emphasis on enhancing math and science content knowledge.

II-C. Instructional strategies for the integration of subject-area content will be presented using a variety of resources.

II-D. Teachers will be provided with the needed supplies, materials, manipulatives, and technological components to promote classroom learning and student achievement and will be provided training on how to use these resources during the teacher workshops.

II-E. Pre-service teachers who attend Troy University will have the opportunity to be included in all Academy workshops and activities without taking away spots or resources (that are funded by ACHE) from in-service teachers.

WMSTLA met these goals and objectives each year through many activities, some of which are described later in this document.

WMSC (2002-2008) had similar goals and objectives and focused on utilizing aerospace education to improve teacher effectiveness in the classroom. Troy University had gone through major changes and reorganization during the period of this project.

3. Project Design

The Wiregrass Math, Science, and Technology Leadership Academy has developed a comprehensive, logical, and research-based program model designed to achieve the goals and objectives outlined above for both pre-service and full time classroom teachers in grades K-12. The following standards from the Alabama Course of Study were addressed in the project:

Science-Physical Science

Kindergarten: Standards (2), (4), (10).

1st Grade: Standards (8), (11).

2nd Grade: Standards (4), (5), (8), (10).

3rd Grade: Standards (11), (12), (14).

4th Grade: Standards (4), (8), (9), (10).

5th Grade: Standards (6), (10), (11).

6th Grade: Standards (1), (10), (11).

Math

5th Grade: Standards (3), (7), (8), (11), (12), (13).

6th Grade: Standards (2), (3), (4), (7), (8), (9).

7th Grade: Standards (3), (4), (5), (6), (8), (9), (10), (11).

8th Grade: Standards (1), (4), (5), (6), (8), (9), (10), (11), (12).

During the Summer Institute, the most intensive component of the program, workshops and keynote session topics were selected and made available to participating teachers based on each session's relevancy to the teaching profession and required state curriculum standards as expressed in the Alabama Course of Study for Math and Science in grades K-12. During 2011-2012, WMSTLA conducted a four-day summer institute with two follow-up workshops on Fridays, 8am-4:30pm, with substitute pay for the schools to cover their classes. From 2013, a five-day workshop with two half-day (8am-noon) follow-up sessions on Saturdays were conducted. All workshops were facilitated by K-12 master teachers, professional consultants and writers, and faculty members from Troy University College of Education and College of Arts and Sciences. Active learning took place through hands-on activities and inquiry-based problem solving. The integration of technology and writing strategies were stressed. Math and Science Course of Study specifically addressed the need for incorporating technology into the learning environment. The project provided aid for teachers in meeting this technology challenge by allowing them opportunities to work with consultants specializing in technology in the classroom. Teachers were asked go to the Internet to choose and/or write specific lesson plans to coordinate with their experiences to be implemented in their classrooms during the following school year.

Based on consultants' recommendations, WMSTLA provided training on preparation for science lessons using Proscope in 2012 Summer Institute. In the 2013 Summer Institute, the participants engaged in a lively, hands-on experience with the interdisciplinary Private Eye: a journey into the drama and wonder of looking closely at the world, thinking by analogy, changing scale, and theorizing. The Private Eye lead higher order thinking skills, creativity, literacy, and scientific literacy for both students and teachers. In the 2014 summer institute, the participants engaged in a lively, hands-on experience with insect collecting, identifying various insects, and building sampling gear such as sieves and nets to study aquatic ecology. Each in-service teacher participant received an iPad and an extensive education on using it in the classroom for nurturing the minds of their students using many iPad applications. The participants received extensive training in using iPads for effective teaching and their use for optimal learning for students. In the 2015 summer institute, the participants engaged in innovative educational tools using touch screen laptops and they received laptops and extensive training in using laptops to provide effective teaching to enhance student learning. In the 2016 summer institute, the participants received iPad mini 2 Wi-Fi 32GB and extensive training in using them in their classrooms for effective teaching. In addition, each teacher had been provided with supplies, materials, and technology components in order to effectively utilize strategies that they have acquired during the workshops.

Critical thinking can be traced at least as far back as Socrates, who emphasized asking deep questions to cultivate thinking. Critical thinking is essential to problem solving. As educators, we need to provide opportunities for students sharpen their critical thinking skills. It could be through entertaining puzzles or providing a structured lesson that enhances critical thinking. Participants explored ways to provide opportunities for critical thinking and assess the skills.

A majority of the Wiregrass Math, Science and Technology Leadership Academy's project funds are used to directly influence classroom instruction by providing each participant with this much-needed content knowledge and technology training. This instructional allowance further promoted the classroom teacher's ability to employ the Course of Study curriculum standards in an engaging and effective manner.

4 Highlights and strengths of the program

The greatest strength of the program was the very positive acceptance and evaluations of the presenters from the teacher participants. The participants reported, in their written comments, that they were very excited and motivated by the speakers and as evidenced from their written comments. The academy teachers were exposed to some of the most outstanding educational leaders in the nation.

Another strength of the program was the utilization of technology and teaching ideas, which were new to many of the participants. During the summer workshop, participants were exposed to the many innovative educational software, which would allow them to utilize technology and creativity in their subject area.

One of the strengths of the program that cannot be measured or bubbled in on an evaluation is the networking between teacher participants who share stories and ideas with each other. Even though the teachers were all from a relatively small radius around the Troy University- Dothan campus, few of them knew each other or had any idea what was going on in someone else's schools. The forging of new professional relationships and friendships is a very valuable, but difficult to measure, component of the Wiregrass Math, Science, and Technology Leadership Academy. Another aspect difficult to measure is the motivation that the teachers received to go back into their classrooms and use new and innovative ideas to inspire their students. Teachers often are bogged down in the day-to-day minutiae of teaching and they need these workshops to inspire them to keep going and to try and utilize new and creative ideas in their classrooms.

* The training and use of laptops, iPads, minipads, and Proscopes were well received by the participants.
* Participants learned the ability to mirror the iPad on the laptop and vice versa, the use of various apps, software programs and webpages to better teachers' instruction in their classrooms. The participants had an opportunity to experience being in the role of student and reflected on the CCSS standards for Mathematical Practices and shared their experiences with the groups. Through alot of class discussions, collaborations and hands-on experiences, the participants learned what the STEAM lessons should look like in the classroom.
* Participants explored various math concepts by incorporating children's literature and hands-on activities.

* Dr. JeeHae Helen Lee presented The Art of Science in Children's Literature and addressed two questions. Science is often taught during Reading in Elementary Schools. How can we combine Reading and Science and make it engaging? Participants discussed the Art of Science in Children's Literature. Using storytelling books, she provided hands-on science experiments that are creative, fun, and exciting!

Participants enjoyed many activities including:

1. Put Me in the Zoo
2. Glow Powder Activity Guide
3. Floating Water
4. Straw Through Potato
5. Windbags Activity
6. Solar Bag Activity
7. Color Changing UV Beads Activity
8. Insta-Snow
9. Diary of a Worm
10. Burning Money
11. Bubble Bomb Experiment

* Dr. Raghu Gompa presented an Introduction of Mathematical thinking for students. He discussed some strategies to introduce and foster mathematical thinking in students. The participants explored to incorporate these strategies in their classes.

* Dr. Sonja Thomas led a workshop on The World of Entomology engaging participants in a lively, hands-on experience with Insect collection tools and insect collecting guide enforcing concepts of entomology.

Participants learned about all of the insect orders and various methods of identifying insects. They also learned about places to find these insects. They discussed the tools needed to collect various types of insects and prepared their insect collection tools.

The participants learned different ways to collect and preserve insects for classroom display and went excursion outside to the pond to collect insects.

* Gary Kubina led workshop on many concepts of geometry, exploring 3-D Geometry with manipulatives, learning about reflection and rotation using Octagon Magic Trick, demonstrating 2 ways using Triangle Sum Theorem, making 3-D solids using card stock, etc.

* Dr. Alan Wilson led discussions on Aquatic Ecology. The participants built sampling gear such as sieves and nets. They also went to the pond to collect organisms and made experimental design. The participants learned about the scientific method, engaged in aquatic ecology research, and discovered the amazing beauty and diversity of aquatic life residing in ponds and streams. Participants built inexpensive gear to sample diverse aquatic habitats to see the amazing biodiversity of these systems. They also discussed

about the biotic and abiotic factors that influence the structure and function of aquatic communities will help participants link patterns and processes. Participants conducted aquatic ecology experiments aimed at understanding the threat that eutrophication has on water quality.

* Dr. Virginia Vilardi led a workshop on iPads and enforced the concepts of molecules, parts of bacteria, plant and animal cells, human genome. Each participant received an iPad and explored the following educational apps using the iPads.

1. QuickVoice Recorder: the perfect recording tool to record your classes and get feedback on your performance; you can see what you're doing right or wrong and learn how you can improve your lectures.
2. Dropbox: a file storage application that allows you to say goodbye to flash drives and portable hard disks for good. Just sign up to store your files online and then access them from any other computer, your iPad or your smartphone. Ideal for files you use at school and at home.
3. Things for iPad: the perfect task manager to keep track of all your appointments & prepare ahead.
4. Discover: the go-to app for the iPad when you need information on just about anything in the world.
5. Evernote: use Evernote to enter your notes in text or voice format to jot down notes or lesson plans.
6. Pages for iPad: type out all your documents and include any kind of formatting you may need.
7. Numbers for iPad: For all your spreadsheet needs on your iPad, turn to Numbers. It's easy to use, easy to access, and easy to import all your information from your Excel worksheets.
8. Goodreader for iPad: Use this app to access all your documents, PDF files, video and audio files, spreadsheets and many other kinds of files over a wireless network or via USB cable - it makes it dead easy to retrieve files from other systems.
9. Mobile Air Mouse: tool for hosting presentations & conducting lectures using an interactive whiteboard. It turns your iPad into an all-in-one remote control that you can use to manipulate the board without having to resort to using a wireless keyboard and a mouse.
10. WritePad: This app converts your handwriting on the iPad into readable text - use your finger or stylus to get your point across.

* Dr. Jane T. Barnard conducted workshop on Making Measurement Meaningful. Participants received Play dough, scales (grams/ounces), student recording sheets, TI graphing handhelds, cylinders, centimeter grid paper, batteries, rulers, voltage probe, Vernier temperature probes, etc. Participants engaged hands-on activities to examine mass/weight/volume. They estimated, found, and communicated measurements using standard and nonstandard units. Participants investigated

with batteries and measuring voltage, estimated lengths, and investigated volume. They used multiple representations to develop concepts of temperature and related the Celsius and Fahrenheit temperature scales.

* Dr. Robert Vilardi provided a workshop with two sessions, one on Laptop and Tablet basics and the other on Mathematics and Science software. Participants explored Basic setup and program/application information; Convertible Laptop specific applications (Windows Journal, OneNote, Physics Illustrator, SnagIt, Evernote, and others); Security and Virus Protection information (AVG, Panda, SUPERAntiSpyware, etc.); Open source software, freeware, and proprietary software. Participants also explored several programs, applications, and tools on the laptops that are geared towards Mathematics and Science instruction. Programs included Geogebra, Geometers Scetchpad, Physics Illustrator, Sage, XCAS, Maple, Mathematica, 3D Graphing Calculator, WinPlot, Cam Studio, Camtasia, GIMP, Audacity, and more.

* Through hands-on science experiments, the participants learned everything they need to know about polymers.

* Hands-on activities of controlled flight using balloons and other controlling devices.

* Hands-on activities including paper folding with Patty Paper compass & straightedge as we developed the traditional Unit Circle as well as the Fahrenheit-Celsius relationship. This was followed by data collection and display in graphical form, then by a STEM in Forensics mystery. Concluded with an investigation of the "Birthday Problem."

* Through hands-on experiences, the participants learned about the federal department's best practices in teaching math.

* The participants were introduced to the Private Eye exciting way of introducing math and science concepts using the Private Eye educational materials. Teachers received extensive training on the careful implementation of new approach. Teachers went through STEM activities, learned how to design technology integrated lesson plans tailored to be used with Common Core State Standards and Next Generation Science. Teachers received The Private Eye Teacher Guide, The Class Loupe Set (36 loupes in polygrid case), The Private Eye Deluxe World-in-a-Bag (two loupes and eight specimens), The Private Eye Notebook, The Private Eye Motivational Poster, Lesson Handouts such as Loupe Leash and Head Leash, and Overhead/PPT slide set (CD)-(Selection of 28 Workshop slides for classroom use).

* The participants were introduced to Hand-held Microscope and learned the concepts of scale and magnification and how microscopes/lenses work. Teachers received training on a "Proscope" that included Proscope instrument demonstration, software overview, assembly of scopes and free exploration. Teachers went through STEM activities, learned how to design technology integrated lesson plans tailored to be used with Common Core State Standards and Next

Generation Science. Teachers received Proscopes and Micro World Teacher Guide Notebooks. One of the teachers communicated how she used Proscope in her classes through a website- attached in the appendix.

* Dr. Wil Robertson, an Aerospace Education Specialist from Marshall Space Flight Center in Huntsville, showed the teachers how to set up a SKYPE account and access NASA resources. As part of his presentation, the participants were exposed to SKYPE presentations from education specialists in NASA installations in Huntsville and at Stennis Space Center in Mississippi. Any of these programs and presenters can be requested for classroom use through the NASA education outreach offices. A highlight of the day was a live SKYPE interview with Astronaut Doug Wheelock from Johnson Space Center in Houston, Texas. Wheelock, who has been a strong supporter of education in the Wiregrass area, answered questions from the audience and told personal stories of his time as commander on board the International Space Station as well as giving a motivational talk on the importance of teaching and touching students in the classroom. Many of the participants said that his message was just what they needed to hear to encourage them and motivate them during the middle of the school year when things often very hectic for them and they lose sight of why they are teaching. At the end of the day, all full time teachers who participated were given high quality web cams for their classroom use and were encouraged to use them to access not only NASA resources but also other people and classrooms around the world.

* Local TV stations covered some activities and broadcasted in the evening news.

* E-mail communications were effectively used for development of agenda for summer institute and educational items were bought based on participants' input. Detailed agenda was provided through email that turned out to be very helpful for effective preparation and participation from the teachers.

* A website was designed to recruit and receive all the information about the participants which are essential for project report: http://spectrum.troy.edu/vgompa/wmstl/WMSTLAcademy/

APPENDIX A

TWELVE (12) STANDARDS FOR EFFECTIVE PROFESSIONAL DEVELOPMENT IN ALABAMA[12]

Standard 1: Effective professional development organizes adults into learning communities whose goals are aligned with those of the school, the system, and the state.

Standard 2: Effective professional development requires knowledgeable and skillful school and system leaders who actively participate in and guide continuous instructional improvement.

Standard 3: Effective professional development requires resources to support adult learning and collaboration.

Standard 4: Effective professional development uses disaggregated student data to determine adult learning priorities, monitor progress, and help sustain continuous improvement.

Standard 5: Effective professional development uses multiple sources of information to guide improvement and demonstrate its impact.

Standard 6: Effective professional development prepares educators to apply research to decision making.

Standard 7: Effective professional development uses learning strategies appropriate to the intended goal.

Standard 8: Effective professional development applies knowledge about human learning and change.

Standard 9: Effective professional development provides educators with the knowledge and skills to collaborate.

Standard 10: Effective professional development prepares educators to understand and appreciate all students; creates safe, orderly, and supportive learning environments; and holds high expectations for their academic achievement.

Standard 11: Effective professional development deepens educators' content knowledge, provides them with research-based instructional strategies to assist students in meeting rigorous academic standards, and prepares them to use various types of classroom assessments appropriately.

Standard 12: Effective professional development provides educators with knowledge and skills to involve families and other stakeholders appropriately.

[12] Alabama State Board of Education Resolution Adopted: June 13, 2002

APPENDIX B

"HIGH NEED" LOCAL EDUCATION AGENCIES[13]
(LEAs / School Districts)

"High Need" Local Education Agencies are defined according to U.S. Census Bureau Poverty Estimates[14] and data from ALSDE Accountability Reports[15]

<u>County Districts</u>

Barbour
Bibb
Blount
Bullock
Butler
Chambers
Cherokee
Chilton
Choctaw
Clarke
Coffee
Conecuh
Coosa
Dale
Dallas
Dekalb
Escambia
Fayette
Franklin
Geneva
Greene
Henry
Houston
Lowndes
Macon
Marengo
Marion
Marshall
Mobile
Monroe
Montgomery
Perry
Pike
Sumter
Talladega
Tallapoosa
Walker
Wilcox
Winston

<u>City Districts</u>

Albertville City
Alexander City
Anniston City
Bessemer City
Birmingham City
Brewton City
Cullman City
Daleville City
Demopolis City
Dothan City
Elba City
Eufaula City
Fairfield City
Florence City
Fort Payne City
Gadsden City
Geneva City
Huntsville City
Jacksonville City
Lanett City
Leeds City
Linden City
Midfield City
Oneonta City
Opelika City
Opp City
Oxford City
Ozark City
Pell City City
Phenix City
Piedmont City
Roanoke City
Russellville City
Saraland City
Scottsboro City
Selma City
Sylacauga City
Talladega City
Tallassee City
Thomasville City
Troy City

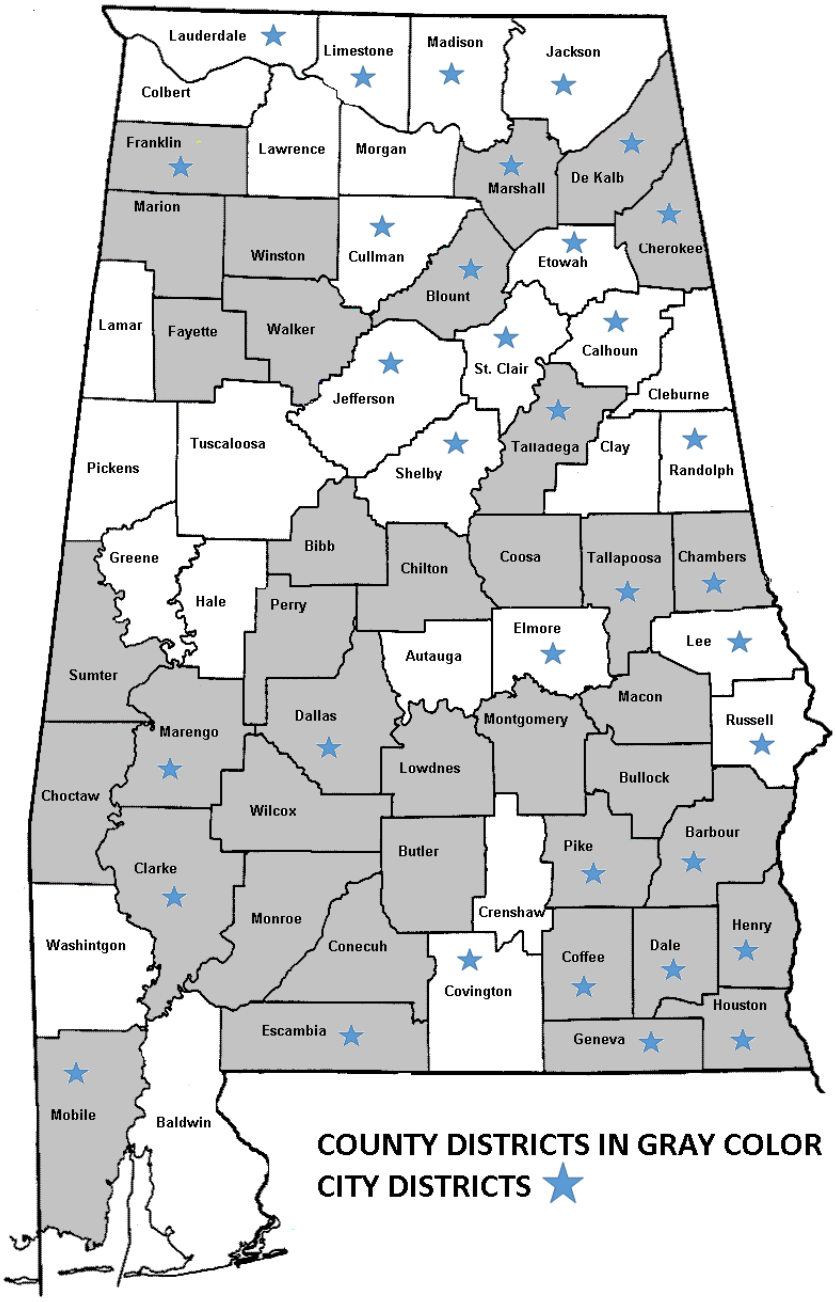
[13] "High need" definition established by No Child Left Behind (P.L. 107-110, Title II, Section 2012(3)) and US Department of Education Non-Regulatory Guidance, Section F-5.

[14] Definition as determined by U. S. Census Bureau Poverty Estimates: (A)(i) that serves not fewer than 10,000 children from families with incomes below the poverty line; **or** (ii) for which not less than 20 percent of the children served by the agency are from families with incomes below the poverty line; **and** (B) (i) for which there is a high percentage of teachers not teaching in the academic subjects or grade levels that the teachers were trained to teach; **or** (ii) for which there is a high percentage of teachers with emergency, provisional, or temporary certification or licensing.

[15] ALSDE data showing 5% or more teachers in districts are not highly qualified(http://www.alsde.edu/Accountability/2009reports/HighlyQualifiedTeachersRPT_BySystem.pdf?lstSchoolYear=7&lstReport=2009reports%2FHighlyQualifiedTeachersRPT_BySystem.pdf; http://www.census.gov/cgi-bin/saipe/saipe.cgi)

APPENDIX B1

Map of High Need County and City School Systems



APPENDIX C

EXTERNAL FUNDING PARTNERS

The institutions offering ACHE No Child Left Behind (NCLB) projects reported in-kind contributions (facilities, indirect cost supplements and services) as well as funding from partner school districts. External funding was provided by companies, foundations, federal agencies and businesses represented below as reported by the projects:

Alabama Department of Economic and Community Affairs (ADECA)
Alabama Gives Day
Alabama Humanities Foundation
Alabama LASER
Alabama Power Foundation
Alabama School for the Deaf
Alabama Shakespeare Festival
Alabama State Council for the Arts
Alabama State Department of Education
Alabama Technology in Motion
American Honda Foundation
Association for Supervision and Curriculum Development
Athens Bible College
Blue Cross-Blue Shield
Birmingham Botanical Gardens
Birmingham Public Library
Birmingham Museum of Art
Books-A-Million
Bowman Foundation
Buffalo Rock
Carolina Biological Supply Co.
Caring Foundation
CCV Software
Gadsden Center – University of Alabama
Gulf Coast Exploreum
Gulf Coast Hanger
Higher Ground Roasters
Hoover Foundation
John Lockett, Attorney
International Paper
Kathy G & Co.
Learning Tree
Leeds Optimist
Legacy, Inc.
Library of Congress
Lowder Family Foundation
Math Helper
McDowell Environmental Center
McWane Science Center
Mineral Information Institute
Mobile Museum of Art
Montgomery Museum of Fine Art
NASA
NASCO Science
National Science Foundation
Navy Reserve
Office Max
Pearson Publishing

Central Alabama Community Foundation
Center for Archeological Studies
ChildCraft Educational Foundation of America
Chick-Fil-A
Civil Air Patrol
Concordia College – Selma
Corwin Press – Sage Publications
Cottage Hill Cleaners
Cultural Alliance of Greater Birmingham
Daniel Foundation
Delta Education
Domino's Pizza – Gadsden
Dothan Area Chamber of Commerce
Dry Cleaners of Mobile
"Economics America"
Educational Foundation of America
Engineering is Elementary
Fisher Scientific
Publix Grocery
Rosen Classroom BooksSERVE, Inc.
Rutgers University
St. John's Episcopal Church
Southeast Center for Education in the Arts
Southern Museum of Flight
Temple Beth-Or
Tensor Foundation
The Private Eye®
Tom Snyder Software
Toyota
Tractor and Equipment
Trader Joe's
University of Alabama Press
Vulcan Park
Wal-Mart
"We the People"
Wright Attitudes
WHIL (Mobile)

APPENDIX D:

EXTERNAL PEER REVIEW PANEL MEMBERS

FY2002/2003 – FY2015/2016[16]

Panel Member	Title	Agency / Institution / School	Year(s) of Panel Service ǂ = panel chair
Dr. Katherine Mitchell	Director	Alabama Reading Initiative (ARI), Alabama State Department of Education	2002 *(ARI lead)*
Dr. Susan Villaume	ARI Visiting Scholar	Alabama Reading Initiative (ARI), Alabama State Department of Education	2002
Dr. Mary Spor	ARI Consultant	Alabama Reading Initiative (ARI), Alabama State Department of Education	2002
Ms Cassandra Wheeler	ARI staff	Alabama Reading Initiative (ARI), Alabama State Department of Education	2002
M.s Pam Duke	ARI staff	Alabama Reading Initiative (ARI), Alabama State Department of Education	2002
Dr. Ann Jones	Professor	College of Education, University of West Alabama	2002ǂ
Dr. Larry C. Mullins	Dean	School of Liberal Arts, Auburn University at Montgomery	2002
Ms. Martha Chavers	Certified Grant Specialist, Retired Teacher	Dothan, AL	2002; 2003ǂ; 2004ǂ; 2005ǂ
Ms. Katherine Elrod			2002
Dr. Charlotte Carter	Dean	Division of Arts and Sciences, Stillman College Tuscaloosa, AL	2003; 2004
Dr. William Richardson	Dean	College of Arts and Sciences, Troy University - Montgomery	2003; 2004

[16] Projects awarded FY2015-2016 grants were continued in FY2016-2017, the final year of the NCLB higher education professional development program for teachers; therefore, the FY2015-2016 panels were the last proposal review panels convened in this program.

Ms. Cale Ebert	Vice President	Alabama Council of Teachers of Mathematics; Baldwin County Board of Education, Loxley, AL	2003
Ms. Janis Wingate Stewart	Principal	Meadowview Elementary School, Selma, AL	2003
Dr. Catherine Moore	Coordinator, Federal Programs	Alabama State Department of Education	2003
Dr. Anita T. Buckley-Commander	Director, Classroom Improvement	Alabama State Department of Education	2003
Dr. John Vickers	Interim Dean	College of Arts and Sciences Alabama A & M University Huntsville, AL	2004
Dr. Janet Warren	Dean	School of Education, Auburn University at Montgomery	2004
Ms. Cynda Fickert	2004 Alabama Teacher of the Year	Auburn Junior High School	2004; 2006
Ms. Cyndi Hill Townley	Education Specialist	Federal Programs Section, Alabama State Department of Education	2004
Dr. Vagn K. Hansen	Dean	College of Arts and Sciences, University of North Alabama	2005; 2006
Dr. Cynthia Harper	Dean	College of Education & Professional Studies Jacksonville State University	2005; 2006; 2007; 2008♯
Dr. Michael A. Cooke	Dean	College of Liberal Arts, University of West Alabama	2005
Dr. Sandra Lee Jones	Dean (retired)	College of Education, Troy University – Dothan	2005
Dr. Benjamin Benford	Dean	College of Liberal Arts and Education, Tuskegee University	2005; 2006; 2007
Dr. Edward L. Shaw, Jr.	Professor	Elementary Science Education, College of Education, University of South Alabama	2005; 2006; 2007
Ms. Margaret Petty	2005 Alabama Teacher of the Year	Special Education Teacher, Rainbow Elementary School Madison, AL	2005
Dr. Anita Buckley-Commander	Director	Classroom Improvement, Alabama State Department of Education	2005
Ms. Nancy Vawter	Supervisor	Secondary Science & Health, Montgomery Public Schools	2006♯; 2007♯
Ms. Cameron McKinley	2006 Alabama Teacher of the Year,	Integrated Technology Teacher, Riverchase Elementary School, Hoover, AL	2006

Ms. Audrie Bradford	Education Specialist	Federal Programs, Alabama State Department of Education	2006; 2007; 2008; 2009; 2010; 2011; 2012; 2013; 2014; 2015
Dr. Jack Riley	Dean	Graduate Studies; Professor of Curriculum and Instruction, College of Education University of Montevallo	2007; 2008; 2014; 2015♯
Dr. Sandra Enger	Associate Professor of Science Education	University of Alabama in Huntsville	2008
Dr. Martha Hocutt	Dean	Julia S. Tutwiler College of Education, University of West Alabama	2008; 2009; 2010♯; 2013♯; 2014♯
Mr. Roy Hudson	2008 Alabama Teacher of the Year	Theatre Instructor Shades Valley High School Birmingham, AL	2008; 2009
Ms. Christine H. Nassar	Supervisor	Secondary Science, Mobile County Schools	2008
Dr. William S. Richardson	Interim Dean	College of Arts and Sciences, Troy University	2009
Ms. Shelia V. Patterson	Math Specialist	Alabama Math, Science, Technology Initiative (AMSTI); Alabama Department of Education	2009; 2010; 2011; 2012; 2013; 2014
Dr. Jennifer A. Brown	Dean	School of Education, Auburn University at Montgomery	2010
Dr. Catherine Shields	Science Faculty	Jefferson County International Baccalaureate School (division of Shades Valley High School), Birmingham	2010; 2011♯; 2012♯
Dr. Gypsy Abbott	Research Scientist – Evaluation and Assessment	Birmingham	2010
Mr. Phil Rodney Wilson	2010 Alabama Teacher of the Year	Fine Arts Teacher, Ogletree Elementary School, Auburn	2010
Dr. Kevin A. Rolle	Executive Vice President	Alabama A & M University, Huntsville	2011; 2012
Dr. Gay F. Barnes	2011 Alabama Teacher of the Year	First Grade Teacher, Horizon Elementary School Madison	2011
Ms. Martha Lockett	Arts Specialist	Alabama State Department of Education	2011

Dr. Celia Rudolph	Chair	Department of Teacher Education, Huntingdon College Montgomery	2012; 2013
Ms. Suzanne Culbreth	2012 Alabama Teacher of the Year	Math Teacher, Spain Park High School Hoover	2012
Dr. James F. Rinehart	Dean	College of Arts & Sciences; Professor of International Relations, Troy University	2013; 2014
Ms. Tracy Pruitt	2013 Alternate Alabama Teacher of the Year	Elementary Math Teacher, Montana Street Academic Magnet School, Dothan	2013
Dr. Richard Littleton	Institutional Evaluator	Chelsea, AL	2013
Dr. Katie Cole Kinney	Associate Professor	Instructional Technology, College of Education and Human Science, University of North Alabama, Florence	2014
Dr. Michael Burger	Dean	College of Arts & Sciences, Auburn University at Montgomery	2015
Dr. Reenay R. H. Rogers	Chair	Department of Instructional Leadership & Support; Director, Assessment and Evaluation; Julia Tutwiler College of Education, University of West Alabama Livingston	2015
Ms. Jennifer Brown	2015 Alabama Teacher of the Year	Science Teacher, Vestavia Hills High School	2015
Ms. Kristie Taylor	Mathematics Specialist	Alabama Math, Science, Technology Initiative (AMSTI); Alabama Department of Education	2015